CATALOGUE

OF THE

FISHES

IN THE

BRITISH MUSEUM.

BY

ALBERT GÜNTHER,
M.A., M.D., PH.D., F.R.S., F.Z.S., ETC., ETC.

VOLUME SEVENTH

LONDON:
PRINTED BY ORDER OF THE TRUSTEES.
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CATALOGUE

OF THE

PHYSOSTOMI

CONTAINING THE FAMILIES

HETEROPYGII, CYPRINIDÆ, GONORHYNCHIDÆ,
HYODONTIDÆ, OSTEOGLOSSIDÆ, CLUPEIDÆ,
CHIROCENTRIDÆ, ALEPOCEPHALIDÆ, NOTOPTERIDÆ.
HALOSAURIDÆ,

IN THE

COLLECTION

OF THE

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PREFACE.

Dr. Günther observes,—"This volume contains the Cyprinoid and Clupeoid Fishes and several other small families formerly associated with them, but already more or less distinctly separated by Valenciennes

"The number of species treated of in this volume amounts to 1281; many (407) are so imperfectly known that it appeared to be sufficient to mention them by name only. Cuvier and Valenciennes enumerated 673 species in the corresponding parts of the 'Histoire Naturelle des Poissons,' 318 of this number being either nominal or very imperfectly described species.

"Most of the Collections whence the specimens described in this volume have been obtained are mentioned in the preceding volumes, so that I have to refer to the following only:—

"1. The typical specimens of East-Indian Cyprinoids and Clupeoids described by Dr. Bleeker.

"2. A Collection of species from the Dutch East-Indian possessions and Holland, formerly in the Museum of the late Dr. van Lidth de Jeude; purchased of Mr. Damon.

"3. A Collection from the Cossye and Morar rivers, presented by Lieut. R. C. Beavan, F.Z.S.

"4. A Collection from Cachar and Northern India, presented by Lieut.-Col. Playfair, F.Z.S.

"5. Several Collections from the Madras Presidency, obtained of Surgeon F. Day, F.Z.S.

"6. A small Collection from Angola, presented by Dr. Welwitsch.

"7. A Collection from Western Africa, presented by R. B. N. Walker, Esq.

"8. A large Collection of the Freshwater Fishes of Central Europe, presented by Prof. v. Siebold, For.M.R.S.

"9. A Collection of Bavarian Freshwater Fishes made by Dr. Gemminger.

"10. A Collection from the rivers of Dalmatia and Montenegro, obtained of the Milan Museum.

"11. A Collection of Portuguese Freshwater Fishes, presented by Dr. B. du Bocage, Director of the Lisbon Museum.

"12. A Collection of typical examples of North American species described by E. Cope, Esq.

"13. A Collection of Mexican Freshwater Fishes, purchased of M. Boucard."

JOHN EDWARD GRAY.

British Museum
Nov. 1, 1867.

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CATALOGUE

OF

FISHES.

Subclass I. TELEOSTEI.

(CONTINUED.)

Order IV. PHYSOSTOMI.

(CONTINUED.)

Fam. 16. HETEROPYGII.

Heteropygii, *Tellkampf, Müller's Archiv*, 1844, p. 392.
Hypsæidæ, *Storer, Mem. Amer. Acad.* ii. 1846, p. 435.

Head naked, body covered with very small scales; barbels none. Margin of the upper jaw formed by the intermaxillaries. Villiform teeth in the jaws and on the palate. Adipose fin none. Dorsal fin belonging to the caudal portion of the vertebral column, opposite to anal. Ventral fins rudimentary or absent. Vent situated before the pectorals. Stomach with a blind sac; pyloric appendages present. Pseudobranchiæ none; air-bladder deeply notched anteriorly.

Caves of North America; South Carolina.

Two genera are known:—

Eyes none, or rudimentary .... 1. AMBLYOPSIS.
Eyes distinct .... 2. CHOLOGASTER.

1. AMBLYOPSIS.

Amblyopsis, *Dekay, Nat. Hist. New York, Fish.* p. 187.
Typhlichthys, *Girard, Proc. Ac. Nat. Sc. Philad.* 1859, p. 62.

Eyes none, or rudimentary. A band of teeth on each palatine bone; vomerine teeth none. Ventral fins rudimentary and occasionally entirely absent. Viviparous.

Caves of Kentucky.

1. Amblyopsis spelæus.

Amblyopsis spelæus, *Dekay, l. c.*; *Wyman, in Sillim. Amer. Journ.* 1843, vol. xlv. pp. 94–96; or in *Ann. & Mag. Nat. Hist.* 1843, xii. p. 298; *Proc. Bost. Soc. Nat. Hist.* 1850, iii. pp. 349–357; 1854, iv. pp. 395–396; and 1854, v. pp. 18–19; *Sillim. Amer. Journ.* 1854, xvii. pp. 258–261; *Thompson, Ann. Nat. Hist.* 1844, xiii. p. 112; *Tellkampf, in Müller's Arch.* 1844, pp. 381–394, tab 9; *Agassiz, in Sillim. Amer. Journ.* 1851, xi. p. 127; *Poey, Mem. Cub.* ii. p. 104.

Typhlichthys subterraneus, *Girard, l. c.*

B. 6. D. 10. A. 9. V. 4–0. Cæc. pyl. 2. Vert. 13/19–20.

Head with vertical wrinkles; lower jaw slightly longer than the upper. Colourless.

Caves of Kentucky.

a. Five inches long. Presented by — Wedgewood, Esq.
b, *c*, *d*, *e*, *f*. Adult and halfgrown.
g. Adult: skeleton. Presented by G. H. Virtue, Esq.

Variety without ventral fins:—

h. Halfgrown. Mammoth Cave. Presented by Capt. J. G. Godman.

2. CHOLOGASTER.

Chologaster, *Agassiz, in Amer. Journ. Sc. & Arts,* 1853, xvi. p. 135.

This genus differs from *Amblyopsis* in being provided with eyes. Ventral fins none.

South Carolina.

1. Chologaster cornutus.

Agassiz, l. c.

Snout with two horn-like projections above.

Ditches of rice-fields in South Carolina.

Fam. 17. CYPRINIDÆ.

Cyprinidæ, *Agassiz, Poiss. Foss.* v. p. 5.

Body generally covered with scales, head naked. Margin of the upper jaw formed by the intermaxillaries. Belly rounded, or, if trenchant, without ossicles. No adipose fin. Stomach without blind sac. Pyloric appendages none. Mouth toothless; lower pharyngeal bones well developed, falciform, subparallel to the branchial arches, provided with teeth, which are arranged in one, two, or three series. Air-bladder large, divided into an anterior and posterior portion by a constriction, or into a right and left portion, enclosed in an osseous capsule; absent in *Homaloptera*. Ovarian sacs closed.

Fresh waters of the Old World and North America.

We first give a synopsis of the groups, and then one of the genera.

Synopsis of the Groups.

I. Air-bladder divided into an anterior and posterior portion, not enclosed in an osseous capsule. Barbels 0–4.

A. Pharyngeal teeth in a single series, exceedingly numerous, and closely set. Dorsal fin elongate, opposite to ventrals; anal fin short. Barbels none. 1. **Catostomina**, p. 12.
(Gen. 1–4.)

B. Pharyngeal teeth in a single, double, or triple series, in small number, the outer series never containing more than seven teeth.

1. Anal fin very short, with five or six (exceptionally seven) branched rays.

a. Lateral line running along the median line of the tail. Dorsal fin opposite to ventrals.
2. **Cyprinina**, p. 25.
(Gen. 5–43.)

b. Lateral line running along the median line of the tail. Dorsal fin inserted behind the ventrals.
3. **Rohteichthyina**, p. 191.
(Gen. 44.)

c. Lateral line running along the lower half of the tail. Dorsal fin opposite to ventrals.
4. **Leptobarbina**, p. 192.
(Gen. 45.)

d. Lateral line running along the lower half of the tail. Dorsal fin inserted behind the origin of ventrals.
5. **Rasborina**, p. 193.
(Gen. 46–50.)

2. Anal fin short, or of moderate length, with from (seven) eight to eleven branched rays, not extending forwards to below the dorsal fin. Lateral line, if complete, running in, or nearly in, the middle of the tail.

a. Dorsal fin elongate, with numerous branched rays, and with an osseous ray. 6. **Semiplotina**, p. 203.
(Gen. 51, 52.)

b. Dorsal fin short, with an osseous ray.
7. **Xenocypridina**, p. 205.
(Gen. 53–55.)

c. Dorsal fin short, without osseous ray. Pharyngeal teeth in a single or double series.
8. **Leuciscina**, p. 207.
(Gen. 56–65.)

3. Anal fin of moderate length, extending forwards to below the dorsal. Lateral line, if complete, running in, or nearly in, the middle of the tail.
9. **Rhodeina**, p. 276.
(Gen. 66–68.)

4. Anal fin of moderate length or elongate. Lateral line running along the lower half of the tail. Abdomen not trenchant . . . . 10. **Danionina**, p. 281.
(Gen. 69–77.)

5. Anal fin elongate. Lateral line running nearly along the middle of the tail. Abdomen not trenchant. No dorsal spine . . . . 11. **Hypophthalmichthyina**, p. 298.
(Gen. 78.)

6. Anal fin elongate. Abdomen, or part of abdomen, compressed . . . . 12. **Abramidina**, p. 299.
(Gen. 79–95.)

II. **Air-bladder none. Barbels 6 (–0). Pectoral and ventral fins horizontal, the former with the outer rays simple.**
13. **Homalopterina**, p. 340.
(Gen. 96, 97.)

III. **Air-bladder partly or entirely enclosed in a bony capsule. Barbels 6–12** . . . . 14. **Cobitidina**, p. 344.
(Gen. 98–107.)

Synopsis of the Genera.

I. Pharyngeal teeth in a single series, exceedingly numerous, and closely set. Dorsal fin elongate, opposite to ventrals; anal fin short. Barbels none. CATOSTOMINA. North America and North-eastern Asia.

Dorsal fin with about 17 rays; lateral line present.
1. CATOSTOMUS, p. 12.

Dorsal fin with about 17 rays: lateral line none.
2. MOXOSTOMA, p. 20.

Dorsal fin with about 30 or more rays; pharyngeal bones sickle-shaped, with the teeth compressed and increasing in size downwards.
3. SCLEROGNATHUS, p. 22.

Dorsal fin with about 30 or more rays; pharyngeal bones thin and compressed, with a series of nearly equally minute compressed teeth.
4. CARPIODES, p. 24.

II. Pharyngeal teeth in a single, double or triple series, in small number, the outer series never containing more than seven teeth. Never more than four barbels, if any. Air-bladder present, without osseous covering[*].

A. Anal fin very short, with five or six (exceptionally seven[†]) branched rays.

1. *Lateral line running along the median line of the tail. Dorsal fin opposite to ventrals.* CYPRININA.

a. *Dorsal fin with more than nine branched rays.*

α. Pharyngeal teeth in three series, the outer molar-like.

An osseous dorsal ray.......................... 5. CYPRINUS, p. 25.

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[*] The following fish are so insufficiently described that their systematic position cannot be ascertained from the accounts given:—

1. Cyprinus potail, *Sykes, Trans. Zool. Soc.* ii. p. 354.—Beema River, Dekkan.
2. Leuciscus nesogallicus, *Cuv. & Val.* xvii. p. 310.—If the specimens to which this name has been given really are from the Mauritius, they cannot belong to *Leuciscus*, as this genus is absent from Tropical Africa as well as India.—D. 9. A. 12. L. lat. 45.
3. —— caverii, *Jerdon, Madr. Journ. Lit. & Sc.* xv. p. 320.—Cavery River.—A. 6.
4. —— flavus, *Jerdon, l. c.*—Carnatic.—A. 6.
5. —— xanthogramme, *Jerdon, l. c.* p. 321.—Mysore and Carnatic.—A. 6.
6. —— microcephalus, *Jerdon, l. c.*—Madras.
7. —— argenteus, *Basilewsky, Nouv. Mém. Soc. Nat. Mosc.* 1855, x. p. 232.—Pekin.—A. 9, abdomen carinatum.
8. —— presbyter, *C. & V.* xvii. p. 307.—Bombay.—D. 11. A. 7. L. lat. 26.
9. —— rubripes, *Jerdon, l. c.* p. 322.—Bowany River.

[†] Compare *Barbus obtusirostris* (p. 121), *Barbus lawak* (p. 149), and *Hybognathus regius* (p. 185), which have ten or eleven anal rays.

β. *Pharyngeal teeth in a single series.*

An osseous dorsal ray.......................... 6. Carassius, p. 29.

γ. *Pharyngeal teeth in three series, none molar-like.*

aa. *Gill-rakers long, setiform, closely set.*

Mandibulary symphysis loose .... 7. Catla, p. 34.

bb. *Gill-rakers short, subconical.*

Snout depressed; lips thin, the upper not fringed; edge of the mandible rather sharp; a symphysial tubercle. D. 13–17. 8. Cirrhina, p. 35.

Snout more or less depressed; upper lip thin, but fringed; edge of the mandible rather sharp; a symphysial tubercle. D. 26–33.
9. Dangila, p. 37.

Lips more or less thickened; the osseous part of the mandible forms a hard, sharp, transverse prominence; no symphysial tubercle. D. 13–21.
10. Osteochilus, p. 40.

Snout more or less swollen; each lip with an inner transverse fold, which is covered with a deciduous horny substance forming a sharp edge which is soft and flexible. D. 13–20 .... 11. Labeo, p. 45.

Form of the mouth without peculiarity; it is arched, without inner folds or horny covering.................................. 12. Barynotus, p. 61.

b. *Dorsal fin with not more than nine branched rays.*

α. *Pharyngeal teeth in three series; anal scales not enlarged.*

aa. *The greater part of the cheek is uncovered by bone; no adipose eyelid.*

Form of the mouth essentially as in (11.) *Labeo*; scales of moderate size.
13. Tylognathus, p. 62.

Form of the mouth essentially as in (11.) *Labeo*; scales small.
14. Abrostomus, p. 67.

Lower lip modified into a suctorial disk, with free anterior and posterior margins; pectoral fins horizontal.............. 15. Discognathus, p. 68.

Lower jaw transverse, with a narrow lip which is not continuous with the upper lip, and with a sharp inner transverse edge. Snout without lateral lobe.
16. Crossochilus, p. 71.
(16 *a*. Gymnostomus, p. 75.)

Lower jaw transverse, with a broad double lip continuous with the upper lip, and with a sharp bony inner transverse edge. Snout with a free moveable lateral lobe .... 17. Epalzeorhynchus, p. 76.

Mouth transverse, inferior, each mandible angularly bent inwards in front, the anterior mandibular edge being nearly straight, rather sharp, and covered with a horny layer. No lower labial fold...... 18. Capoeta, p. 77.

Mouth arched, without inner folds or other peculiarities. Pseudobranchiæ present .... 19. Barbus, p. 82.

Structure of the mouth without peculiarities. Pseudobranchiæ none. Barbels none.. 20. Thynnichthys, p. 157.

bb. *Cheek entirely covered by the dilated suborbital bones. No adipose eyelid.*

Dorsal fin without osseous ray .... 21. Barbichthys, p. 158.

cc. *Orbit with a broad annular adipose eyelid.*

Caudal fin not scaly............................ 22. Amblyrhynchichthys, p. 159.
Basal half of the caudal fin scaly .... 23. Albulichthys, p. 159.

β. Vent and anal fin in a sheath covered with enlarged, tiled scales. Body sealy. Pharyngeal teeth in a triple series.

Mouth transverse, inferior. Mandibles broad, short, and flat, loosely joined together; margin of the lower jaw with a horny layer.
24. Oreinus, p. 160.

Mouth arched. Mandibles of usual length and width.
25. Schizothorax, p. 162.

γ. Vent and anal fin in a sheath, covered with enlarged, tiled scales. Pharyngeal teeth in a double series.

Body scaly structure of the mouth without peculiarities.
26. Ptychobarbus, p. 169.

Body naked; structure of the mouth without peculiarities.
27. Gymnocypris, p. 169.

Body nearly entirely naked; margin of the lower jaw transverse, cutting, covered with a horny layer; barbels none .... 28. Schizopygopsis, p. 170.

Only a part of the side is scaly; mouth curved; lower jaw with a cutting margin, covered with a horny layer; barbels two. 29. Diptychus, p. 171.

δ. Pharyngeal teeth in a single series. Body naked. No anal sheath.

Dorsal fin with a serrated spine............... 30. Aulopyge, p. 171.

ε. Pharyngeal teeth in a double or single series. Body entirely scaly; no anal sheath.

Barbels two; mouth inferior; intermaxillaries protractile. Pharyngeal teeth 5/3 or 2—2 or 3/5. Intestinal tract short. 31. Gobio, p. 172.

Barbels two or none; mouth inferior; Pharyngeal teeth 5—5. Dorsal fin conspicuously in advance of ventral, without stiff ray.
32. Pseudogobio, p. 174.

Barbels two. Pharyngeal teeth 4/1 or 0—0 or 1/4. Dorsal fin not, or but slightly in advance of ventral .... 33. Ceratichthys, p. 176.

Barbels two; mouth anterior. Pharyngeal teeth 5—5. Origin of the dorsal fin in advance of that of ventrals............... 34. Bungia, p. 179.

Barbels none. Dorsal fin with a stiff ray in front. Lateral line incomplete.
35. Pimephales, p. 180.

Barbels none. Dorsal fin with a stiff ray in front. Lateral line complete.
36. Hyborhynchus, p. 181.

Barbels none. Mouth inferior; intermaxillaries protractile; lower jaw with a sharp margin. Pharyngeal teeth 4—4. Air-bladder enveloped by the convolutions of the intestine .... 37. Campostoma, p. 182.

Barbels none. Mouth anterior. Intermaxillaries protractile; lower jaw with a rather sharp edge. Intestinal tract with numerous convolutions.
38. Hybognathus, p. 183.

Barbels none. Mandibulary and opercular bones with muciferous cavities.
39. Ericymba, p. 185.

Mouth very small, transverse, directed upwards; mandible with a hard, trenchant edge.. 40. Pseudorasbora, p. 185.

Jaws with spoon-shaped bony expansions, their edge being trenchant as in *Tetrodon* .... 41. Cochlognathus, p. 186.

Mandibles united by a broad symphysis, the symphysial portion being prominent, narrow, tongue-shaped, sharp ...... 42. Exoglossum, p. 187.

Intermaxillaries not protractile. Pharyngeal teeth 4/1—2/4.
43. Rhinichthys, p. 188.

2. *Lateral line running along the median line of the tail. Dorsal fin inserted behind the ventrals.* ROHTEICHTHYINA.

Dorsal fin with a strong serrated ray ...... 44. ROHTEICHTHYS, p. 191.

3. *Lateral line running along the lower half of the tail. Dorsal fin opposite to ventrals.* LEPTOBARBINA.

Dorsal fin without osseous ray .... 45. LEPTOBARBUS, p. 192.

4. *Lateral line running along the lower half of the tail. Dorsal fin inserted behind the origin of ventrals.* RASBORINA.

a. *Lateral line complete. Pharyngeal teeth in a triple series, none being molar-like.*

Cleft of the mouth extending to the front margin of the orbit. 46. RASBORA, p. 193.

Cleft of the mouth extending beyond the front margin of the orbit. 47. LUCIOSOMA, p. 198.

b. *Pharyngeal teeth in a single series.*

Barbels four, the upper very long .... 48. NURIA, p. 200.

c. *Pharyngeal teeth in a double series; lateral line incomplete.*

Barbels none .... 49. APHYOCYPRIS, p. 201.

d. *Lateral line incomplete. Pharyngeal teeth in a triple series, some of them being molar-like.*

Mouth small, lower jaw prominent .... 50. AMBLYPHARYNGODON, p. 201.

B. Anal fin short or of moderate length, with from (seven) eight to eleven branched rays, not extending forwards to below the dorsal fin. Lateral line, if complete, running in, or nearly in, the middle of the tail.

1. *Dorsal fin elongate, with numerous branched rays and with an osseous ray.* SEMIPLOTINA.

Dorsal spine serrated .... 51. CYPRINION, p. 203.

Dorsal spine smooth .... 52. SEMIPLOTUS, p. 204.

2. *Dorsal fin short, with an osseous ray.* XENOCYPRIDINA.

Barbels none; pharyngeal teeth in a triple series; dorsal spine smooth. 53. XENOCYPRIS, p. 205.

Barbels two: pharyngeal teeth in a double series; dorsal spine smooth. 54. PARACANTHOBRAMA, p. 205.

Barbels two; pharyngeal teeth in a triple series; dorsal spine serrated. 55. MYSTACOLEUCUS, p. 206.

3. *Dorsal fin short, without osseous ray; pharyngeal teeth in a single or double series.* LEUCISCINA.

a. *Margin of the lower jaw not trenchant; barbels none.*

Intermaxillaries protractile. Scales imbricate. Outer surface of the pharyngeal teeth smooth.................................... 56. LEUCISCUS, p. 207.

Similar to *Leuciscus*, but outer surface of the pharyngeal teeth deeply folded. 57. CTENOPHARYNGODON, p. 261.

Intermaxillaries not protractile .... 58. MYLOPHARODON, p. 262.

Body scaleless or with rudimentary, non-imbricate scales. Pharyngeal teeth in a single series .... 59. Paraphoxinus, p. 263.

Body scaleless. Pharyngeal teeth in a double series.
60. Meda, p. 263.

b. *Margin of the lower jaw not trenchant; barbels present, small.*

Pharyngeal teeth in a single series............ 61. Tinca, p. 264.

Pharyngeal teeth in a double series .... 62. Leucosomus, p. 266.

c. *Margin of the lower jaw trenchant.*

Upper and lower simple caudal rays not increased in number.
63. Chondrostoma, p. 272.

Upper and lower simple caudal rays very numerous. Pharyngeal bones with the upper limb very broad and concave, separated by a deep notch from the dentigerous portion .... 64. Orthodon, p. 275.

Upper and lower simple caudal rays very numerous. Pharyngeal bones without a greatly dilated portion .... 65. Acrochilus, p. 276.

C. Anal fin of moderate length, extending forwards to below the dorsal. Lateral line, if complete, running in, or nearly in, the middle of the tail. Pharyngeal teeth in a single series. Rhodeina.

Lateral line complete .... 66. Achilognathus, p. 276.

Lateral line incomplete. Scales of moderate size.
67. Rhodeus, p. 279.

Lateral line incomplete. Scales small....... 68. Pseudoperilampus, p. 280.

D. Anal fin of moderate length or elongate. Lateral line running along the lower half of the tail. Abdomen not trenchant. Danionina.

1. *Dorsal fin with nine or more branched rays, the posterior being opposite to the anal fin.*

Mouth narrow .... 69. Danio, p. 281.

Mouth wide .... 70. Pteropsarion, p. 284.

2. *Dorsal fin with less than nine branched rays, inserted behind the ventrals.*

Mouth inferior, narrow. Pharyngeal teeth in three series. Suborbitals broad.
71. Aspidoparia, p. 285.

Mouth anterior, wide. Pharyngeal teeth in three series. Suborbitals broad.
72. Barilius, p. 286.

Mouth very wide. Pharyngeal teeth in two series. Suborbitals broad.
73. Bola, p. 293.

Mouth of moderate width. Pharyngeal teeth in two series. Suborbitals not dilated .... 74. Schacra, p. 294.

3. *Dorsal fin with nine (ten) or less than nine branched rays, opposite to the ventrals; anal fin not extending forwards to below the dorsal.*

Mouth extending to or to below the orbit; barbels none.
75. Opsarichthys, p. 295.

Mouth not extending to the orbit; barbels two.
76. Squaliobarbus, p. 296.

Mouth not extending to the orbit; barbels none.
77. Ochetobius, p. 298.

E. Anal fin elongate. Lateral line running nearly along the middle of the tail. Abdomen not trenchant. No dorsal spine. Hypophthalmichthyina.

Pharyngeal teeth in a single series. .... 78. Hypophthalmichthys, p. 298.

F. Anal fin elongate. Abdomen, or part of abdomen, compressed. Abramidina.

1. *Pectoral fins of moderate length.*

a. *No dorsal spine. Pharyngeal teeth in a double or single series.*

Gill-rakers rather short. The attachment of the gill-membrane to the isthmus takes place at some distance behind the vertical from the orbit. Lateral line complete .... 79. Abramis, p. 299.

Gill-rakers short and widely set. The attachment of the gill-membrane to the isthmus takes place below the hind margin of the orbit. Lateral line complete. 80. Aspius, p. 310.

Gill-rakers slender, lanceolate, closely set. Lateral line complete. 81. Alburnus, p. 312.

Lateral line incomplete .... 82. Leucaspius, p. 318.

b. *No dorsal spine. Pharyngeal teeth in a triple series.*

Mouth not extending to below the eye. Suborbitals narrow. 83. Rasborichthys, p. 319.

Mouth extending to below the eye. Suborbitals narrow. 84. Elopichthys, p. 320.

(Suborbitals broad .... 85. Pelotrophus, p. 320.)

c. *A dorsal spine. Pharyngeal teeth in a single series.*

Scales small .... 86. Acanthobrama, p. 322.

d. *A dorsal spine. Pharyngeal teeth in a triple series.*

aa. *Dorsal spine smooth.*

Scales small. Air-bladder bipartite .... 87. Osteobrama, p. 322.

Scales of moderate size. Air-bladder tripartite. 88. Chanodichthys, p. 325.

bb. *Dorsal spine serrated.*

Scales small .... 89. Smiliogaster, p. 327.

2. *Pectoral fins unusually long.*

a. *A dorsal spine.*

Dorsal spine smooth .... 90. Culter, p. 328.

b. *No dorsal spine.*

Dorsal fin above anal. Lateral line abruptly bent downwards. Pharyngeal teeth in a double series. Ventrals well developed. 91. Pelecus, p. 330.

Dorsal fin above anal. Lateral line abruptly bent downwards. Pharyngeal teeth in a triple series. Ventrals well developed. 92. Eustira, p. 331.

Dorsal fin above anal. Lateral line gradually bent downwards. Not less than seven ventral rays................................ 93. Chela, p. 331.

Dorsal fin entirely in advance of anal. Lateral line gradually bent downwards. 94. Pseudolaubuca, p. 339.

Ventral fin filiform, with less than seven rays. 95. Cachius, p. 339.

III. Pectoral and ventral fins horizontal, the former with the outer rays simple. Dorsal and anal fins short, the former opposite to ventrals. Barbels six (or none). Air-bladder absent. Homalopterina.

Barbels six .... 96. Homaloptera, p. 340.
Barbels none.................................... 97. Psilorhynchus, p. 343.

IV. Mouth surrounded by six or more barbels. Anal fin short. Scales small, rudimentary or absent. Air-bladder partly or entirely enclosed in a bony capsule. Cobitidina.

A. Dorsal fin opposite to ventrals.

1. *No erectile suborbital spine.*

Barbels ten or twelve .... 98. Misgurnus, p. 344.
Barbels six .... 99. Nemachilus, p. 347.

2. *An erectile suborbital spine.*

Spine below the eye; caudal not emarginate; barbels six.
100. Cobitis, p.
Spine below the eye; caudal not emarginate; barbels eight.
101. Lepidocephalichthys, p. 364.
Spine in advance of the eye .... 102. Acanthopsis, p. 365.
Spine below the eye; caudal forked .... 103. Botia, p. 366.

B. Dorsal fin at some distance behind the ventrals.

1. *No erectile suborbital spine.*

Barbels six .... 104. Oreonectes, p. 369.

2. *An erectile suborbital spine.*

Ventral fins. Barbels six, four being at the extremity of the snout.
105. Lepidocephalus, p. 369.
Ventral fins. Barbels six, two being at the extremity of the snout.
106. Acanthophthalmus, p. 370.
Ventral fins none .... 107. Apua, p. 371.

Aperioptus pictorius, p. 371.

◆

Appendix to Cyprinidæ........................ Kneria, p. 371.

First Group. CATOSTOMINA.

Pharyngeal teeth in a single series, exceedingly numerous and closely set. Dorsal fin elongate, opposite to ventrals; anal short or of moderate length. Barbels none.

North America and North-eastern Asia.

1. CATOSTOMUS*.

Catostomus, sp., *Lesueur, Journ. Ac. Nat. Sc. Philad.* i. 1817, p. 88; *Cuv. & Val.* xvii. p. 418.

——, sp., et Rhytidostomus, sp., *Heckel, in Russegger's Reisen,* i. p. 1022.

Ptychostomus, Hylomyzon et Catostomus, *Agassiz, in Amer. Journ. Sc. & Arts,* xix. 1855, pp. 88–92.

Minomus, Acomus, &c., *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 173.

Scales of small, moderate, or large size. Lateral line present, running along the middle of the tail. Dorsal fin of moderate extent, with not more than about seventeen rays, opposite to the ventrals, without spine. Anal fin very short but deep. Fins of the males generally more produced than those of the females, and frequently with horny tubercles. Mouth inferior, with the lips more or less thickened and papillose, the lower frequently bilobed. Barbels none. Gill-rakers well developed, soft, the upper lanceolate, the lower quite membranaceous, low folds crossing the bone. Pseudobranchiæ. Pharyngeal bones sickle-shaped, armed with a comb-like series of numerous compressed teeth, the teeth becoming larger and broader towards the lower end of the series.

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* 1. Catostomus longirostrum, *Lesueur, l. c.* p. 102.—State of Vermont.—Snout long; eyes large; scales very small. D. 12 (? 13). Five inches long.
2. —— oneida, *Dekay, New York Fauna, Fish.* p. 198.—Lake Oneida.—D. 15. Scales large.
3. Ptychostomus albidus, *Girard, in U. St. & Mex. Bound. Survey, Ichthyol.* p. 36, pl. 19. figs. 5–8.—Rio San Juan, New Leon.—Scales rather small.
4. Catostomus insignis, *Baird & Girard, in Proc. Ac. Nat. Sc. Philad.* 1854, p. 28; Minomus insignis, *Girard, in U. St. & Mex. Bound. Survey, Ichthyol.* p. 37, pl. 21. figs. 1–4.—Rio San Pedro, Tributary of Rio Gila.—D. 13. L. lat. 60.
5. —— clarkii, *Baird & Girard, in Proc. Ac. Nat. Sc. Philad.* 1854, p. 27; Minomus clarkii, *Girard, in U. St. & Mex. Bound. Survey, Ichthyol.* p. 38. pl. 22. figs. 5–8.—Rio Santa Cruz.—D. 13–14 (12 in figure). L. lat. 68–70.
6. —— (Acomus) generosus, *Girard, in Proc. Ac. Nat. Sc. Philad.* 1856, p. 174; or *in U. St. Pac. R. R. Exped. Fish.* p. 221.—Cottonwood Creek, Utah.—Scales very small.
7. —— (Acomus) lactarius, *Girard, in Proc. Ac. Nat. Sc. Philad.* 1856, p. 174; *U. S. Pac. R. R. Exped. Fish.* p. 223, pl. 50.—Upper Missouri.
8. —— sucklii, *Girard, in Proc. Ac. Nat. Sc. Phil.* 1856, p. 175; *U. S. Pac. R. R. Exped. Fish.* p. 226, pl. 51.—Milk River, Upper Missouri.—D. 14. Scales large.
9. —— texanus, *Abbott, Proc. Ac. Nat. Sc. Philad.* 1860, p. 473.—Colorado and New Rivers.—D. 15. "Scales of medium size."
10. —— chloropteron, *Abbott, l. c.*—Kansas.—D. 13.
11. Cyprinus rostratus, *Tiles. Mém. Ac. Sc. St. Pétersb.* iv. 1813, p. 454, tab. 15. figs. 1–2; or *in Pallas, Zoogr. Ross.-As.* iii. p. 307; Catostomus tilesii, *Cuv. & Val.* xvii. p. 469.—Eastern Siberia.—Scales small; snout much produced, the eye being behind the middle of the length of the head. Lower lip bilobed.

North America; Eastern Siberia.

The *skeleton* of *Catostomus* has been well described by Valenciennes (xvii. p. 433). It is distinguished by the comparative want of solidity, certain bones consisting merely of a network of osseous matter. There is a large and broad fontanelle on the upper surface of the head, separating the parietal bones and leading direct into the cerebral cavity. The occipital process is, below the anterior vertebræ, enlarged into a bladder-like swelling, which is not solid, but consists of a delicate osseous network only. The prefrontal is advanced to the anterior part of the orbit. The jaw-bones are very feeble, the intermaxillary being reduced to a thin lamella, which does not descend to the middle of the maxillary. The anterior part of the mandible is horizontal, thin, and slightly dilated. The apophyses of the four anterior vertebræ are very strong and long. Number of vertebræ

in *Catostomus teres* 29 abdominal, 18 caudal;
in *Catostomus carpio* 27 abominal, 14 caudal.

1. **Catostomus hudsonius.**

Cyprinus catostomus, *Forster, Philos. Trans.* lxiii. 1773, p. 155, tab. 6.
Catostomus hudsonius, *Lesueur, Journ. Ac. Nat. Sc. Philad.* i. p. 107; *Cuv. & Val.* xvii. p. 459.
—— forsterianus, *Richards. Frankl. Journ.* p. 720, and *Faun. Bor.-Amer. Pisc.* p. 116; *Cuv. & Val.* xvii. p. 463.
—— aurora, *Agass. Lake Super.* p. 360, pl. 2. figs. 3–4.

D. 12–13. A. 8–9. L. lat. 100–110. L. transv. 15/23.

The height of the body is rather less than the length of the head, which is contained from four times and two-thirds to five times in the total length (without caudal). Lips very thick, papillose, the lower deeply bilobate. Eye small, behind the middle of the length of the head, the snout being much produced. Suborbital very narrow. There are twelve or thirteen longitudinal series of scales between the lateral line and the root of the ventral fin. Scales on the fore part of the trunk conspicuously smaller than those on the tail. Pectoral fin not extending to the vertical from the origin of the dorsal, which is nearer to the root of the caudal than to the end of the snout.

Subarctic regions of North America.

a. Adult, in bad state, has been in chloride of zinc. Old collection. Probably one of the typical specimens examined by Forster.
b. Young. Fort Halket. Presented by B. R. Ross, Esq.
c. Adult: stuffed. Albany River. Presented by Sir J. Richardson as *Catostomus forsterianus*.

d–e. Adult: stuffed. Albany River.
f–g. Half-grown: stuffed. Arctic regions. Collected by J. Rae, Esq.

Forster knew and described one species only, which subsequently received the name of *hudsonius* from Lesueur. As I know the species examined by Forster, I am enabled to state that Richardson and others erroneously applied that name to species with larger scales. Pennant (Arch. Zool. i. p. cxcii) was the first to confound a large- and a small-scaled species under the name given by Forster to the latter.

Agassiz (Lake Superior, p. 357) speaks of Forster's "second variety," "upon consulting the original memoir of Forster." I am unable to find anything in this memoir which would indicate that Forster examined two varieties.

2. **Catostomus griseus.**

Catostomus (Acomus) griseus, *Girard, in Proc. Ac. Nat. Sc. Philad.* 1856, p. 174, and in *U. S. Pac. R. R. Exped. Fish.* p. 222, pl. 49. figs. 5–9.

D. 13?. A. 10?*.

Scales small. The height of the body is contained four times and two-thirds in the total length (without caudal), the length of the head four times and one-fourth. Lips papillose, thick, the lower bilobed. Eye small, a little behind the middle of the length of the head, the snout being much produced. Scales on the fore part of the trunk conspicuously smaller than those on the tail. Pectoral fin not extending to the vertical from the origin of the dorsal, which is equidistant from the end of the snout and the root of the caudal. (*Girard.*)

Sweetwater fork of Platte River.

3. **Catostomus latipinnis.**

Catostomus latipinnis, *Baird & Girard, Proc. Ac. Nat. Sc. Philad.* 1853, p. 388.
Acomus latipinnis, *Girard, l. c.* 1856, p. 173, and *U. St. & Mex. Bound. Survey, Ichthyol.* p. 39, pl. 24. figs. 1–6.

This species is evidently closely allied to *C. hudsonius*, from which it appears to differ in having longer pectoral fins. Probably the specimens examined were males, with longer fins than the females have; but none of the male specimens of the northern *C. hudsonius* have the pectoral fins so much developed as *C. latipinnis*.

D. 14. A. 9.

Scales very small. The height of the body is contained five times in the total length (without caudal), the length of the head four times and two-thirds. Lips very thick, papillose, the lower deeply bilobate. Eye small, nearly in the middle of the length of the head, the snout being much produced. Suborbital very narrow. Pectoral fin extending beyond the vertical from the origin of the dorsal (in male specimens?) (*Gir.*)

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* According to the letterpress; the artist employed to illustrate Mr. Girard's notes on these fishes appears to have counted differently.

Rio San Pedro, tributary of the Rio Gila.

4. Catostomus guzmaniensis.

Catostomus (Acomus) guzmaniensis, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 173, and in *U. St. & Mex. Bound. Survey, Ichthyol.* p. 39, pl. 23. figs. 6–10.

D. 14. A. 9.

Scales very small. The height of the body is equal to the length of the head, and contained four times and two-thirds in the total (without caudal). Lips very thick, papillose, the lower bilobed. Eye small, in the middle of the length of the head. The pectoral fin extends to, or nearly to, the vertical from the origin of the dorsal. Back and sides dark-coloured, with an orange longitudinal band. (*Gir.*)

Janos River, tributary of Lake Guzman, Chihuahua.

5. Catostomus plebejus.

Catostomus plebejus, *Baird & Girard, Proc. Ac. Nat. Sc. Philad.* 1854, p. 28.

Minomus plebejus, *Girard, in U. St. & Mex. Bound. Survey, Ichthyol.* p. 38, pl. 22. figs. 1–4.

D. 11. A. 8. L. lat. ca 80.

The height of the body is nearly equal to the length of the head, which is contained four times and two-thirds in the total (without caudal). Lower lip moderately bilobed. Eye of moderate size, a little behind the middle of the length of the head. Snout elongate. There are twenty-eight or thirty longitudinal series of scales between the dorsal and ventral fins. Origin of the dorsal fin nearly midway between the end of the snout and the root of the caudal. (*Girard.*)

Rio Mimbres, tributary of Lake Guzman.

6. Catostomus teres.

Cyprinus catostomus, *Peck, Mem. Amer. Acad.* ii. pt. 2. p. 55, pl. 2. fig. 4 (not *Forster*).

? Cyprinus commersonnii, *Lacép.* v. pp. 606, 610.

Cyprinus teres, *Mitch. Lit. & Phil. Trans. New York*, i. p. 458; ?*Lesueur, Journ. Ac. Nat. Sc. Philad.* i. 1817, p. 108.

Catostomus communis, *Lesueur, Journ. Ac. Nat. Sc. Philad.* i. 1817, p. 95; *Cuv. & Val.* xvii. p. 426; *Dekay, New York Fauna, Fish.* p. 196, pl. 33. fig. 106; *Kirtland, Bost. Journ. Nat. Hist.* v. p. 265, pl. 19. fig 1.

—— bostoniensis, *Lesueur, l. c.* p. 106; *Cuv. & Val.* xvii. p. 432; *Storer, Report Ichthyol. Massach.* p. 84, and *Mem. Amer. Acad.* v. 1855, p. 290, pl. 22. fig. 3.

Cyprinus (Catostomus) hudsonius, *Richards. Faun. Bor.-Amer. Pisc.* p. 112 (not synon.).

—— (——) reticulatus, *Richards. l. c.* p. 303.

Catostomus pallidus, *Dekay, l. c.* p. 200, pl. 33. fig. 104.

Catostomus nigricans, *Storer, Report Ichth. Massach.* p. 86 (not *Lesueur*).
—— florealis, *Baird.*

D. 14(–15). A. 8–9. L. lat. 59–70. L. transv. $\frac{10-11}{13-14}$.
Vert. 29/18.

The height of the body is equal to, or somewhat more than, the length of the head, which is two-ninths or nearly one-fourth of the total (without caudal). Lips very thick, papillose, the lower deeply bilobate. Eye small, behind the middle of the length of the head (more so in old than in young examples); suborbital of moderate width, but narrower than the fleshy part of the cheek below it. There are eight or nine longitudinal series of scales between the lateral line and the root of the ventral. Scales on the fore part of trunk conspicuously smaller than those on the tail, frequently with the free margin more or less distinctly lobate.

Northern parts of America.

a–b. Young: skins. Ohio. From Dr. Parnell's Collection.
c. Adult. New York. Purchased of Mr. Brandt.
d. Fine specimen. Massachusets. Presented by Th.M oore, Esq.
e. Adult. Boston. Presented by B. Winstone, Esq.
f–g. Adult. Memniack River, Massachusets. Purchased of Mr. Wright.—L. lat. 65.
h. Adult. Lake Bangely. Purchased of Mr. Wright.
i–m. Large specimens. Montreal. Purchased of Mr. Wright.—L. lat. 60.
n. Young. Montreal. Purchased of Mr. Wright.—L. lat. 65.
o. Skin, 23 inches long. Lake Huron. Presented by Sir J. Richardson.—L. lat. 69.—Type of *C. reticulatus.*
p–r. Adult: skins. Albany River. Presented by Sir J. Richardson as *C. hudsonius.*
s–u. Adult: stuffed. Arctic regions. Presented by J. Rae, Esq.
v. Adult: stuffed. Lake Madawaska, Lower Canada.—L. lat. 60.
w. Adult: stuffed.—L. lat. 64.
x. Skeleton of adult female. Montreal. Purchased of Mr. Wright.

This appears to be the species described in Agassiz's 'Lake Superior,' p. 358, as *C. forsterianus*; the author of that description enters into details of characters common to all species of *Catostomus*, but does not even mention the number of either scales or fin-rays.

Catostomus labiatus, Ayres, in Proc. Calif. Acad. Nat. Sc. i. 1855, p. 32; Girard, in U. S. Pac. R. R. Exped. Fish. p. 224, from California, is, according to the description, most closely allied to *C. teres.*

7. Catostomus aureolus.

Catostomus aureolus, *Lesueur, l. c.* p. 95; *Cuv. & Val.* xvii. p. 439; *Agass. Lake Super.* p. 357.
Ptychostomus aureolus, *Agassiz, Amer. Journ. Sc. & Arts,* xix. 1855, p. 89.

D. 14. A. 8–9. L. lat. 63.

Form of the body similar to that of *C. teres.* Lower lip bilobed.

Snout scarcely projecting beyond the mouth. Eye small. Scales on the fore part of the trunk equal in size to those on the tail.

Lakes Erie and Superior.

8. Catostomus occidentalis.

Castostomus occidentalis, *Ayres, in Proc. Calif. Ac. Nat. Sc.* i. 1854, p. 18; *Agassiz, in Amer. Journ. Sc. & Arts,* xix. 1854, p. 94; *Girard, in U. S. P. R. R. Exped. Fish.* p. 224.

Closely allied to *C. teres.*

D. 14. A. 8–9. L. lat. 70. L. transv. $\frac{12-13}{14-15}$.

The height of the body is less than the length of the head, which is contained four times and three-fourths in the total (without caudal). Lips broad, slightly papillose, the lower deeply bilobate. Eye small, but little behind the middle of the length of the head; suborbital narrow, much narrower than the fleshy part of the cheek below it. There are nine or ten longitudinal series of scales between the lateral line and the root of the ventral. Scales on the fore part of trunk much smaller than those on the tail. Origin of the dorsal fin a little nearer to the end of the snout than to the root of the caudal.

California.

a–b. Adult. San Francisco. Presented by W. O. Ayres, Esq., M.D.

9. Catostomus bernardini.

Catostomus bernardini, *Girard, Proc. Ac. Nat. Sc. Philad*ᵃ 1856, p. 175, *and in U. St. & Mex. Bound. Survey, Ichthyol.* p. 40, pl. 23. figs. 1–5.

This species is but little known, and very doubtful.

D. 14. A. 9.

Apparently closely allied to *C. teres*, but with the eye larger and in the middle of the length of the head (according to figure). Scales apparently of the same size as in *C. teres*, those on the fore part of the trunk being smaller than those on the tail. The height of the body is nearly equal to the length of the head, and two-ninths of the total (without caudal). Lips very thick, papillose, the lower deeply bilobate. (*Gir.*)

San Bernardino, in an affluent of the river Huagui, Mexico.

10. Catostomus nigricans.

Catostomus nigricans, *Lesueur, l. c.* p. 102; *Kirtland, Bost. Journ. Nat. Hist.* v. p. 273, pl. 21. fig. 3.
—— maculosus, *Lesueur, l. c.* p. 103.
—— fasciolaris, flexuosus, megastomus, xanthopus, *Rafinesque.*
Exoglossum macropterum, *Rafinesque.*
Hypentelium macropterum, *Rafinesque.*
Catostomus planiceps, *Cuv. & Val.* xvii. p. 450, pl. 516.
Hylomyzon nigricans, *Agassiz, l. c.* p. 90.

D. 13. A. 8–9. L. lat. 48. L. transv. 6½/9.

The height of the body is nearly equal to the length of the head, and about two-ninths of the total (without caudal). Lips papillose, the lower much thicker than the upper, and slightly bilobed. Eye small, situated behind the middle of the length of the head, the snout being much produced; suborbitals very narrow. There are five and a half longitudinal series of scales between the lateral line and the root of the ventral fin. Scales on the fore part of the trunk equal in size to those on the tail. Back and sides marbled with irregular blackish-brown spots.

Rivers Wabask, Ohio, &c.

a. Skin, 9 inches long. Ohio Canal. From Dr. Parnell's Collection.
b. Adult. Youghioghany River, Pennsylvania. Purchased of Mr. Salvin.

11. Catostomus duquesnii.

Catostomus duquesnii, *Lesueur, l. c.* p. 105; *Kirtland, Bost. Journ. Nat. Hist.* v. p. 268, pl. 20. fig. 1, pl. 21. fig. 2.
—— erythrurus, *Rafinesque*.
Ptychostomus duquesnii, *Agassiz, l. c.*

D. 15. A. 8–9. L. lat. 43. L. transv. 6½ 8.

The height of the body is nearly equal to the length of the head, which is one-fourth of the total (without caudal). Lips broad, corrugated, the lower slightly notched. Eye of moderate size, a little behind the middle of the length of the head; suborbitals very narrow. There are four and a half longitudinal series of scales between the lateral line and the root of the ventral fin. Scales on the fore part of the trunk but little smaller than those on the tail. Upper margin of the dorsal fin nearly straight, its origin being a little nearer to the end of the snout than to the root of the caudal fin.

United States (Ohio).

a. Adult. Youghioghany River, Pennsylvania. Purchased of Mr. Salvin.

12. Catostomus macrolepidotus.

Catostomus macrolepidotus, *Lesueur, l. c.* p. 94; *Cuv. & Val.* xvii. p. 447; *Dekay, New York Fauna, Fishes,* p. 202, pl. 77. f. 242.
Cyprinus (Catostomus) sueurii, *Richards. Faun. Bor.-Amer. Pisc.* pp. 118, 303.
Catostomus aureolus, *Dekay, l. c.* p. 201, pl. 42. f. 133 (not *Lesueur*).

D. 15. A. 8–9. L. lat. 44–46. L. transv. 6½/8.

The height of the body is contained thrice and two-thirds in the total length (without caudal), the length of the head five times and a half or six times. Upper lip thin, lower much thicker not bilobed, both corrugated. Eye small, in the middle of the length of the head; suborbitals very narrow. There are four and a half longitudinal series of scales between the lateral line and the root of the ventral fin. Scales on the fore part of the trunk smaller than those on the tail. Upper margin of the dorsal fin ~-shaped, the anterior rays being sometimes a little elongate. Air-bladder with three divisions.

Northern parts of North America.

a. Fine specimen. Lake Erie. Purchased of Mr. Wright.
b–c. Young: skins. Erie Canal. From Mr. Parnell's Collection.
d. Very young. United States. From Mr. Parnell's Collection.
e. Adult: stuffed. Pine Island Lake. Presented by Sir J. Richardson.—Type of *C. sueurii*.
f. Nineteen inches long: stuffed. Albany River. Presented by Sir J. Richardson.
g–h. Adult: stuffed. North America.

13. Catostomus congestus.

Catostomus congestus, *Baird & Girard, Proc. Ac. Nat. Sc. Philad.* 1854, p. 27.
Ptychostomus congestus, *Girard, in U. St. & Mex. Bound. Survey, Ichthyol.* p. 36, pl. 21. figs. 5–8.

D. 13–14. A. 9. L. lat. 46.

The height of the body is contained thrice and four-fifths in the total length (without caudal), the length of the head four times and a half. Lower lip much thicker than the upper. Eye in the middle of the length of the head. Scales on the fore part of the trunk equal in size to those on the tail. (*Gir.*)

Rio Salado, Texas.

14. Catostomus fasciatus.

Catostomus fasciatus, (*Lesueur*) *Cuv. & Val.* xvii. p. 449; *Kirtland, Bost. Journ. Nat. Hist.* v. p. 271, pl. 20. fig. 3.
Ptychostomus (Catostomus) melanops, (*Rafinesque*) *Agassiz, Amer. Journ. Sc. & Arts*, ix. 1855, p. 89.

D. 14–15. A. 8–9. L. lat. 45–48. L. transv. 6½/8.

The height of the body is contained four times in the total length (without caudal), the length of the head four times and one-third. Lower lip thicker than the upper, not bilobed. Eye small, in the middle of the length of the head; suborbitals broad, as broad as, or rather broader than, the fleshy portion of the cheek below. There are five longitudinal series of scales between the lateral line and the root of the ventral fin. Scales on the fore part of the trunk equal in size to those of the tail. Each scale with a very distinct brown spot at the base, the spots forming a continuous streak along each series of scales.

Mississippi, Ohio.

a–b. Skins, 10 and 7 inches long. Ohio Canal. From Dr. Parnell's Collection.

Ptychostomus haydeni, Girard, in Proc. Ac. Nat. Sc. Philad. 1856, p. 172, or in U. St. Pac. R. R. Exped. Fish. p. 220, pl. 49. figs. 1–4, is perhaps identical with this species; however, this author does not mention the form of the suborbital bones.

15. Catostomus carpio.

Catostomus carpio, *Cuv. & Val.* xvii. p. 457, pl. 517.

D. (17–)18. A. 8–9. L. lat. 43–45. L. transv. $6\frac{1}{2}/8\frac{1}{2}$. Vert. 27/14.

The height of the body is contained three times and a quarter or three times and one-third in the total length (without caudal), the length of the head four times or four times and one-third. Lower lip much thicker than the upper, slightly bilobate, both corrugated. Eye small, in the middle of the length of the head; suborbitals narrow. There are four and a half longitudinal series of scales between the lateral line and the root of the ventral fin. Scales on the fore part of the trunk smaller than those on the tail. Upper margin of the dorsal fin convex; dorsal fin sometimes conspicuously elevated, the four or five anterior branched rays being as long as the base of the fin; its origin is nearer to the end of the snout than to the root of the caudal.

Air-bladder with three divisions. Pharyngeal teeth as in the other species.

Lakes Ontario and Erie, Canada.

a. Adult. North America. Purchased of Mr. Brandt.
b–c, *d–f*. Adult. Montreal. Purchased of Mr. Wright.
g. Fine specimen. Lake Erie. Purchased of Mr. Wright.
h. Adult male: skeleton. Montreal. Purchased of Mr. Wright.

16. Catostomus macrochilus.

Catostomus macrochilus, *Girard, in Proc. Ac. Nat. Sc. Philad.* 1856, p. 175; or in *U. S. Pac. R. R. Exped. Fish.* p. 225.

D. 17. A. 9.

Scales of moderate size. "The head constitutes the fifth of the total length; the horizontal diameter of the eye is contained nearly six times in the length of the side of the head. The head itself is subquadrangularly pyramidal, truncated anteriorly, with the upper edge of the snout projecting. The anterior margin of the dorsal is a little nearer the end of the snout than the insertion of the caudal fin. Its upper margin is concave. The anal is well developed; for its tip extends beyond the base of the caudal. The ventrals are inserted opposite the middle of the dorsal. The pectorals are large and long." (*Girard.*)

Astoria, Oregon.

2. MOXOSTOMA*.

Catostomus, sp., *Lesueur*, *Cuv. & Val.*
Moxostoma, (*Rafinesque*) *Agassiz*, *in Amer. Journ. Sc. Arts*, xix. 1855, p. 84.

Scales of moderate size; lateral line none. Fins, mouth, gills, and pharyngeal teeth identical with those of *Catostomus* in all essential points.

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* 1. Cyprinus sucetta, *Lacép.* v. pp. 606, 610; Catostomus sucetta, *Lesueur*, *l. c.* p. 109; Catostomus suceti, *C. & V.* xvii. p. 466; Moxostoma sucetta, *Agassiz.*—Southern States of North America.

2. Catostomus (Moxostoma) anisurus, *Rafinesque & Agassiz.*—United States.

United States.

1. Moxostoma oblongum.

Cyprinus oblongus, *Mitchell, Lit. & Phil. Trans. New York*, i. p. 459.
Catostomus oblongus, *Lesueur, Journ. Acad. Nat. Sc. Philad.* 1817, i. p. 108 (not *Cuv. & Val.*).
?Catostomus gibbosus, *Lesueur, l. c.* p. 92 (D. 17).
Catostomus vittatus, *Lesueur, l. c.* p. 104 (young).
—— tuberculatus, *Lesueur, l. c.* p. 93; *Cuv. & Val.* xvii. p. 444; *Dekay, New York Faun. Fish.* p. 199, pl. 31. fig. 97 (male); *Storer, Report Ichth. Mass.* p. 85.
Labeo elegans, *Dekay, l. c.* p. 192, pl. 31. fig. 100.
—— oblongus, *Dekay, l. c.* p. 193, pl. 42. fig. 136.
—— gibbosus, *Dekay, l. c.* p. 194, pl. 32. fig. 101.
—— esopus, *Dekay, l. c.* p. 195.
Catostomus gibbosus, *Storer, Mem. Amer. Acad.* 1855, v. p. 291, pl. 92. fig. 4.
Moxostoma oblongum, *Agassiz, Am. Journ. Sc. & Arts*, 1855, xix. p. 86.

D. 15. A. 9. L. lat. 44–47. L. transv. 21.

The height of the body is contained three times and one-third in the total length (without caudal), the length of the head four times and one-third. Lips corrugated, the upper narrow, the lower rather broad and bilobate. Eye very small, in the middle of the length of the head; suborbital of moderate width, narrower than the fleshy portion of the cheek below it. Scales on the fore part of the trunk smaller than those of the tail. Coloration uniform.

United States.

a. Adult. Charles River, Massachussets. Presented by Th. Moore, Esq.
b–c. Adult, in bad state. North America. Purchased of Mr. Warwick.
d. Adult. North America.

Catostomus oblongus, Cuv. & Val. xvii. p. 441, is perhaps a distinct species, as it is said to have only thirty-five transverse series of scales.

2. Moxostoma tenue.

Moxostoma tenue, *Agassiz, Amer. Journ. Sc. & Arts*, xix. 1855, p. 88 (name only).
—— claviformis, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 171; *U. St. Pac. R. R. Exped. Fish.* p. 219, pl. 48. figs. 5–9.

D. 13. A. 9. 'L. lat. 45. L. transv. 17.

The height of the body is two-sevenths of the total length (with-

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(Kirtland, *Bost. Journ. Nat. Hist.* v. p. 269, pl. 20. f. 2, appears to have figured some species with a lateral line.)

3. Moxostoma kennerlii, ? = M. victoriæ, ? = M. campbelli, *Girard, Proc. Acad. Nat. Sc. Philad.* 1856, p. 171, and *U. St. & Mex. Bound. Survey, Ichthyol.* p. 34, pl. 20.—Texas.

out caudal), the length of the head two-ninths. Lips corrugated, the upper narrow, the lower rather broad and bilobate. Eye very small, situated a little nearer to the end of the snout than to that of the opercle; suborbital narrow. Scales on the fore part of the trunk smaller than those of the tail.

Pharyngeal teeth with slender base and broader much compressed crown, the upper margin being oblique and terminating in an uncinate projection.

United States.

a. Half-grown. Mobile. Presented by Th. Moore, Esq.

3. SCLEROGNATHUS *.

Catostomus, sp., *Lesueur*.
Sclerognathus, sp., *Cuv. & Val.* xvii. p. 472.
Bubalichthys, Ichthyobus et Cycleptus, *Rafinesque & Agassiz, in Amer. Journ. Sc. & Arts*, xix. 1855, pp. 77–82 †.

Scales of moderate or rather large size. Lateral line running along the middle of the tail. Dorsal fin much elongate, with about thirty or more rays, none of which are spinous. Anal fin short (see *Scl. asiaticus*). Mouth small, inferior or terminal, with the lips more or less thickened. Barbels none. Gill-rakers long, stiff in the upper two-thirds of the first branchial arch, modified into low membranaceous transverse folds in the lower third. Pseudobranchiæ. Pharyngeal bones sickle-shaped, armed with a comb-like series of numerous compressed teeth, increasing in size downwards.

Temperate and subtropical parts of North America; North China.

Two types may be distinguished in this genus:—

α. Mouth inferior: *Bubalichthys*, p. 22.
β. Mouth terminal: *Sclerognathus*, p. 24.

a. Bubalichthys.

1. Sclerognathus urus.

Catostomus bubalus, *Kirtland, Bost. Journ. Nat. Hist.* v. p. 266, pl. 19. fig. 2.
Carpiodes urus, *Agassiz, in Amer. Journ. Sc. & Arts*, xvii. 1854, p. 355.
—— taurus, *Agassiz, l. c.*
? —— vitulus, *Agassiz, l. c.* p. 356.

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* 1. Carpiodes tumidus, *Baird & Girard, Proc. Ac. Nat. Sc. Philad.* 1854, p. 28; Ictiobus tumidus, *Girard, in U. S. & Mex. Bound. Survey, Ichthyol.* p. 34, pl. 19. figs. 1–4.—Fort Brown, Texas. Mouth inferior.
2. —— damalis, *Girard, in Proc. Ac. Nat. Sc. Philad.* 1856, p. 218, pl. 48. figs. 1–4.—Milk River, Upper Missouri. Mouth inferior.

† Agassiz has published a paper on these fishes, in which he refers his trivial generic distinctions to Rafinesquian genera. If any evidence had been wanting to prove the miserable character of the publication of Rafinesque on the Fishes of the Ohio, this paper would amply supply it. And yet the labours of a Cuvier or a Valenciennes are to be superseded by it! A careful examination and distinction of the species of *Catostomi* is still much wanted, as the specific characters offered in Agassiz's paper are quite insufficient.

Bubalichthys urus, taurus et vitulus, *Agassiz, l. c.* xix. 1855, p. 77.
—— niger, bubalus et bonasus, *Agassiz, l. c.*

D. 28–29. A. 10. L. lat. 35–38. L. transv. 7½/8½.

Mouth inferior; the pharyngeal teeth increase in size downwards, the lowest being lamelliform, of rather small size. The height of the body is more than one-third of the total length (without caudal). Anterior dorsal rays of moderate length.

United States.

a. Young: skin. Ohio. Purchased of Dr. Parnell.

A fine specimen from Burlington, Iowa, is in the Liverpool Museum.

2. Sclerognathus meridionalis.

Günth. Trans. Zool. Soc. 1868 (not yet published).

D. 29–30. A. 10. L. lat. 38. L. transv. 7½/7½.

Mouth small, inferior, slightly corrugated. The height of the body is contained thrice and one-third or thrice and one-fourth in the total length (without caudal), the length of the head four times or four times and a half; head not much longer than high. Eye rather small, one-fifth of the length of the head, and two-thirds of that of the snout; suborbitals narrow. The anterior dorsal rays are not much produced, being shorter than the head. Caudal fin forked. The origin of the ventral fin is vertically below the fourth dorsal ray. Pectoral fin not extending to ventral. There are five longitudinal series of scales between the lateral line and the root of the ventral. Coloration uniform.

Pharyngeal teeth very numerous and small, increasing somewhat in size downwards.

Rio Usumacinta (Guatemala).

a–d. From 9 to 10 inches long. From Mr. Salvin's Collection.

3. Sclerognathus elongatus.

Catostomus elongatus, *Lesueur, Journ. Ac. Nat. Sc.* i. p. 103; *Kirtland, Bost. Journ. Nat. Hist.* v. p. 267, pl. 19. fig. 3.
Cycleptus, (*Rafinesque*) *Agassiz, l. c.* p. 82.

D. 35. A. 8.

Scales large. Mouth inferior; pharyngeal teeth of moderate size, increasing in size downwards. The height of the body is about one-fourth of the total length (without caudal). Anterior dorsal rays and caudal lobes prolonged.

Mississippi and tributaries.

4. Sclerognathus asiaticus.

Carpiodes asiaticus, *Bleek. Nederl. Tydschr. Dierk.* ii. 1864, p. 19.

D. 52. A. 13. L. lat. 50. L. transv. 12/?.

The height of the body is two-fifths of the total length (without caudal). Suborbitals narrow. Caudal fin deeply forked. (*Bleek.*)

Northern China.

It is evident from Bleeker's description of the pharyngeal bones that this is not a *Carpiodes*; probably it may prove to be the type of another subgeneric section.

β. Sclerognathus.

5. Sclerognathus cyprinella.

Cuv. & Val. xvii. p. 477, pl. 518.

D. 33. A. 11. L. lat. 41. L. transv. 10/7.

Mouth terminal; the pharyngeal teeth increase in size downwards, but even the largest are of small size. The height of the body is contained twice and three-fourths in the total length (without caudal). Anterior dorsal rays of moderate length. (*Val.*)

Lake Pontchartrain.

Agassiz distinguishes an *Ichthyobus bubalus* (a Rafinesquian name), an *Ichthyobus ranchii* and *stolleyi*, Amer. Journ. Sc. & Arts, xix. 1855, p. 81. If these be distinct species, no one will be able to recognize them from the notes published.

4. CARPIODES.

Catostomus, sp., *Lesueur.*
Sclerognathus, sp., *Cuv. & Val.*
Carpiodes, (*Rafinesque*) *Agassiz, in Amer. Journ. Sc. & Arts,* xix. 1855, p. 74.

Distinguished from *Sclerognathus* by its very thin, compressed pharyngeal bones, which are armed with a comb-like series of nearly equally minute compressed teeth.

United States.

1. Carpiodes cyprinus.

Catostomus cyprinus, *Lesueur, Journ. Ac. Nat. Sc. Philad.* i. 1817, pp. 91, 110; *Thompson, Nat. Hist. Vermont,* p. 133.
Labeo cyprinus, (*Cuv.*) *Dekay, New York Fauna, Fish.* p. 194, pl. 77. fig. 243.
Sclerognathus cyprinus, *Cuv. & Val.* xvii. p. 474; *Kirtland, Boston Journ. Nat. Hist.* v. p. 275, pl. 22. fig. 2.
Carpiodes vacca, *Agass. in Amer. Journ. Sc. & Arts.* xvii. 1854, p. 356.
—— velifer, (*Rafinesque*) *Agass. l. c.* xix. 1855, p. 76.
—— thompsoni, *Agass. l. c.*
? Carpiodes bison, *Agass. l. c.* xvii. 1854, p. 356.

D. 27–32. A. 9. L. lat. 35–40. L. transv. $8/9\frac{1}{2}$.

Mouth inferior. The height of the body is more than one-third of the total length (without caudal). Anterior dorsal rays sometimes much elongate*. There are five and a half longitudinal series of scales between the lateral line and the root of the ventral fin.

United States.

a. Fine specimen. Presented by Max., Prince of Neuwied.

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* It cannot be presumed that all individuals are provided with much-elongate anterior dorsal rays at all seasons, at every age, and of each sex.

Second Group. CYPRININA.

Anal fin very short, with not more than five or six, exceptionally seven, branched rays. Dorsal fin opposite ventrals. Abdomen not compressed. Lateral line running along the median line of the tail. Mouth frequently with barbels, never more than four in number. Pharyngeal teeth generally in a triple series in the Old World genera, in a double or single series in the North American forms, which are small and feebly developed. Air-bladder present, without osseous covering.

5. CYPRINUS[*].

Cyprinus, sp., *Artedi*, *Cuv. Règne Anim.*
Cyprinus, *Nilsson.*

Scales large. Dorsal fin long, with a more or less strong, serrated osseous ray; anal short. Snout rounded, obtuse; mouth anterior, rather narrow. Pharyngeal teeth 3 . 1 . 1—1 . 1 . 3, molar-like. Barbels four.

Temperate parts of Europe and Asia. The common species is domesticated, and has degenerated into many varieties.

1. Cyprinus carpio.

The Carp. Karpfen. La carpe.
Κυπρῖνος, *Aristot. Hist. An.* iv. c. 8; ii. c. 13; vi. c. 14; viii. c. 20.
Cyprinus, *Rondel. De Pisc. Lacustr.* p. 150; *Salvian. Fish.* 92; *Bellon. De Aquat.* p. 273; *Gesner, De Aquat.* p. 309; *Aldrovand. De Pisc.* p. 637; *Marsil. Danub. Pan.-Mys.* p. 57, tab. 19; *Gronov. Zoophyl.* no. 330; *Klein, Miss.* v. p. 59. no. 1.
Carp, *Willugh. Hist. Pisc.* p. 245, tab Q 1. f. 2; *Penn. Brit. Zool.* iii. p. 309, pl. 70, and edit. 1812, iii. p. 467, pl. 81; *Couch, Fish. Brit. Isl.* iv. p. 4.

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[*] Dr. Bleeker, Atl. Ichthyol. iii. p. 73, says, "l'éspèce typique du genre *Cyprinus*, Art., étant un *Leuciscus*, on ne peut appliquer le nom de *Cyprinus* à un genre tout différent." As if Artedi had ever had the intention of expressing the idea of a generic type by placing it first in the series of species! The least acquaintance with his works shows the contrary: thus he places *C. rutilus* as first species in the 'Genera,' *C. idus* in the 'Species' and, finally, *C. carpio* in the 'Synonymy.' Further, he was too well acquainted with the preceding literature not to know that the name *Cyprinus* belonged originally to the Carp alone; and thence he transferred it to other species which he associated with the Carp. To him, all his species of *Cyprinus* were equivalents; and those fanciful and sometimes convenient modern ideas of typical species are entirely absent from his system. How can it be supposed, for instance, that he regarded the Sawfish as the type of his genus *Squalus*?

Doubtful species:—

1. Cyprinus nancar, *Buch. Ham. Fish. Ganges*, p. 299.—Found in the small rivers of the Gorakhpur district.

Cyprinus nobilis, *Schonev.* p. 32.

Cyprinus, *Artedi, Synon.* p. 3. no. 1; *Gener.* p. 4. no. 8; *Spec.* p. 25. no. 13.

Cyprinus carpio, *L. Syst. Nat.* i. p. 525; *Leske, Ichthyologiæ Lipsiensis Specimen, Lips.* 1774, p. 22; *Bl. Fische Deutschl.* i. p. 92, taf. 16; *Bl. Schn.* p. 447; *Lacép.* v. p. 504; *Pallas, Zoogr. Ross.-As.* iii. p. 289; *Lepechin, Reise,* i. pl. 23; *Meidinger,* tab. 9; *Turton, Brit. Faun.* p. 107; *Donov. Brit. Fish.* v. pl. 110; *Flem. Brit. An.* p. 185; *Nilsson, Skand. Faun.* iv. p. 284; *Bonaparte, Faun. Ital. Pesc.*; *Yarrell, Brit. Fish.* i. p. 305, and 2nd edit. i. p. 349, and 3rd edit. p. 354; *Sélys-Longchamps, Faun. Belge,* p. 195; *Kröyer, Danm. Fisk.* iii. p. 290; *Cuv. & Val.* xvi. p. 23; *Nordmann, in Demid. Voy. Russ. Mérid.* iii. p. 476; *Günth. Fische Neckar's,* p. 35; *Heckel & Kner, Süsswasserf.* p. 54; *Siebold, Süsswasserf.* p. 84; *Jeitteles, Verh. zool.-bot. Gesellsch. Wien,* 1862, p. 293, and *Fische d. March,* p. 21; *Canestrini, Prosp. Crit. Pesc. d'Acq. dolce d'Ital., in Arch. Zool. Anat.* 1866, p. 64; *Blanchard, Poiss. France,* p. 322.

Cyprinus cirrosus, *Schäffer, Epist. de Stud. Ichthyol.* p. 18. figs. 1–3.

Carpe, *Duhamel, Pêch.* ii. sect. 3. p. 509, pl. 16. fig. 1; *Jurine, Poiss. Lém.* p. 204, pl. 9.

Carpio vulgaris, *Rapp, Bodensee-Fische,* p. 5.

Varieties of the integuments.

Cyprinus macrolepidotus, *Hartm. Helvet. Ichthyol.* p. 183; *Meidinger, Pisc. Austr.* taf. 41.

Cyprinus nudus, *Bloch, Fische Deutschl.* iii. p. 178 (Leder-Karpfen).

—— coriaceus, *Lacép.* v. p. 528.

Cyprinus, *Marsil. Danub. Pan.-Mys.* tab. 20; *Klein, Pisc. Miss.* v. p. 59. no. 2; *Leske, Ichthyol. Lips.* p. 23. no. 2 β.

Rex cyprinorum, *Kramer, Elench.* p. 390. no. 1 β; *Bloch, Fische Deutschl.* iii. pp. 131 & 178.

Cyprinus cirrosus, *Schæffer, l. c.*

Spiegel-Karpfen, *Bl. Fische Deutschl.* i. p. 107, taf. 17.

Cyprinus specularis, *Lacép.* v. p. 528; *Gronov. Syst.* ed. *Gray,* p. 178.

Varieties of form.

Cyprinus regina, *Bonap. Faun. Ital. Pesc.* c. fig.; *Sélys-Longchamps, l. c.*; *Cuv. & Val.* xvi. p. 63; *Heck. & Kner, Süsswasserfische,* p. 62.

—— hungaricus, *Heckel, Ann. Wien. Mus.* i. p. 222, taf. 19. fig. 1; *Nordm. in Demid. Voy. Russ. Mérid.* iii. p. 477; *Heck. & Kner, Süsswasserfische,* p. 60; *Cuv. & Val.* xvi. p. 65; *Kessler, Bull. Soc. Nat. Mosc.* 1859, xxxii. pt. 1. p. 523; *Jeittelles, Fische der March,* p. 21.

—— elatus, *Bonap. l. c.*; *Sélys-Longchamps, l. c.*; *Cuv. & Val.* xvi. p. 62.

—— nordmannii, *Cuv. & Val.* xvi. p. 66, pl. 456.

—— acuminatus, *Heckel & Kner, Süsswasserfische,* p. 58; *Jeitteles, Verhandl. zool.-bot. Gesellsch. Wien,* 1862, p. 294.

—— bithynicus, *Richards. Proc. Zool. Soc.* 1856, p. 372.

Monstrosities.

Steindachner, Verhandl. zool.-bot. Gesellsch. Wien, 1863, p. 485, tab. 12.

Eastern specimens.

Cyrinus rubro-fuscus, *Lacép.* v. p. 530, pl. 16. fig. 1; *Cuv. & Val.* xvi. p. 74; *Richards. Ichth. Chin.* p. 288.
—— nigroauratus, *Lacép.* v. p. 547, pl. 16. fig. 2; *Cuv. & Val.* xvi. p. 73; *Richards. l. c.* p. 290.
—— viridi-violaceus, *Lacép.* v. p. 547, pl. 16. fig. 3; *Cuv. & Val.* xvi. p. 75; *Richards, l. c.* p. 288.
—— flavipinnis (*Kuhl & v. Hass.*), *Cuv. & Val.* xvi. p. 71; *Bleek. Nat. Tydschr. Ned. Ind.* xiii. p. 345, and *Cyprin. Prodr.* p. 252.
—— vittatus, *Cuv. & Val.* xvi. p. 72.
—— atrovirens, *Richards. l. c.* p. 287.
—— flammans, *Richards. l. c.* p. 288.
—— acuminatus, *Richards. l. c.* p. 289.
—— sculponeatus, *Richards. l. c.* p. 290.
—— hæmatopterus, *Schleg. Faun. Japon. Poiss.* p. 189, pl. 96.
—— melanotus, *Schleg. l. c.* p. 190, pl. 97. fig. 1 (specimen badly fed); *Bleek. Act. Soc. Sc. Indo-Neerl.* viii. *Japan*, vi. p. 94.
—— conirostris, *Schleg. l. c.* p. 191, pl. 97. fig. 2.
—— chinensis, *Basilewsky, Nouv. Mém. Soc. Nat. Mosc.* x. 1855, p. 227, tab. 2. fig. 3.
—— obesus, *Basilewsky, l. c.* p. 228, tab. 1. fig. 2.
Carpio flavipinna, *Bleek. Atl. Ichthyol. Cyprin.* p. 74, tab. 7. fig. 3.

Variety with the fins much prolonged.

Cyprinus hybiscoides, *Richards. l. c.* p. 289.

D. $\frac{3}{17-22}$. A. $\frac{3}{5}$. P. 16. V. 9 (8, 7). L. lat. 35–39.
L. transv. 5/5. Vert. 20–21/16–17.

Two barbels on each side of the upper jaw. Dorsal and anal fins with a strong ray which is serrated behind; caudal deeply emarginate.

Domesticated and consequently with numerous varieties; the depth of the body, the relative length of the head, the size and arrangement of the scales, and the length of the fins are principally subject to variation.

On a *hybrid* between this species and *Carassius vulgaris*, see the latter species.

The Carp is a native of the temperate parts of Asia, especially of China, whence it was introduced to Europe, Java, and America.

α. *European specimens.*

a. Three feet long: stuffed. Surrey. Presented by E. Jesse, Esq. (Weight 22 pounds.)
b. Two feet long: stuffed. Gloucestershire. (Weight 6 pounds.)
c. Fine large specimen. Tredegar Park (Monmouthshire). Presented by the Rev. Aug. Morgan.
d–f. Adult: stuffed. England.
g. Half-grown: skin. Holland. From Gronow's Collection.
h–i. Half-grown: skins. Holland. From Gronow's Collection (*rex cyprinorum*).
k. Adult. Holland. From Dr. Bleeker's Collection.

l. Adult. Neusiedler-See. Presented by Professor v. Siebold (*Cypr. carpio*, var. *hungaricus*).
m–n. Young. Switzerland. From Professor L. Agassiz's Collection. (Spiegel-Karpfen.)
o. Young, in very bad state. Lake Apollonia. Presented by H. Poole, Esq. Type of *C. bithynicus* (Richards.).
p–q. Large fine specimens. Lake of Derkos. From Mr. Millingen's Collection.
r. Skeleton, 3 feet long. Estcourt, Gloucestershire. Presented by E. Bucknall, Esq.
s. Adult: skeleton. England. From the Collection of Mr. E. Gerrard, jun.
t. Skull of a very large specimen. Holland. Purchased of Mr. Damon.
u. Adult: skeleton. Holland. Purchased of Mr. Damon.
v. Adult: skeleton. Lake of Derkos. From Mr. Millingen's Collection. Vert. 21/17.

β. *Asiatic specimens.*

a b. Half-grown. China. Presented by J. R. Reeves, Esq.
c. Half-grown: stuffed. China. Presented by J. R. Reeves, Esq.
d, e–g. Adult and half-grown. Amoy. From Consul Swinhoe's Collection.
h, i–k. Adult and half-grown. Formosa. From Consul Swinhoe's Collection.
l. Adult. Japan. (*C. hæmatopterus.*)
m. Half-grown. Japan. From Dr. Bleeker's Collection as *C. melanotus.*
n, o. Half-grown. Java. (*C. floripinna.*)
p. Adult: skeleton. Amoy. From Consul Swinhoe's Collection.

2. **Cyprinus fossicola.**

Cyprinus (?) fossicola, (*Gray*) *Richards. Ichthyol. Chin.* p. 291.

D. $\frac{3}{19-20}$. A. $\frac{3}{5}$. L. lat. 32–33. L. transv. $\frac{4\frac{1}{2}}{6}$.

Two barbels on each side of the upper jaw. Dorsal and anal fins with a strong ray, which is serrated behind; caudal deeply emarginate. Body elevated, short, its depth being considerably more than the length of the head, which is one-third of the total (without caudal).

China.

a. Half-grown. China. Presented by J. R. Reeves, Esq.
b–c. Adult. From the Haslar Collection.
d. Adult: skin. China. Purchased of Mr. Warwick.

I am not certain whether this is really a distinct species; however, our three specimens agree very well with one another, and with Reeves's figure. The chief character of this form is the large size of the scales between the lateral line and the origin of the dorsal fin. *Cyprinus carpio* has always at least five fully developed longitudinal series on this part of the body, whilst *C. fossicola* has four only.

6. CARASSIUS.

Carassius, *Nilsson, Prodr.*

This genus differs from *Cyprinus* in being without barbels; its pharyngeal teeth are compressed in a single series, 4 4.

Temperate Asia and Europe. Domesticated and degenerated into numerous varieties.

1. Carassius vulgaris.

Crucian Carp. Die Karausche. Ruda (Sweden).

Karass, *Gesner, De Aquat.* p. 318, and *Paralipom.* p. 16.

Carassius, *Will. Hist. Pisc.* p. 249.

Marsil. Danub. Pan.-Mys. iv. tab. 14.

Cyprinus, sp., *Artedi, Genera*, p. 4. no. 7; *Synon.* p. 5. no. 5; and *Species*, p. 29. no. 15; *Klein, Pisc. Miss.* v. p. 59. no. 4, tab. 11. fig. 1; *Gronov. Zoophyl.* no. 343.

Cyprinus carassius, *L. Syst. Nat.* p. 526; *Leske, Ichthyologiæ Lipsiensis Specimen*, 1774, p. 78; *Bl. Fische Deutschl.* i. p. 96, taf. 11; *Bl. Schn.* p. 438; *Lacép.* v. p. 549; *Meidinger, Fische*, tab. 27; *Pall. Zoogr. Ross.-As.* iii. p. 297; *Turton, Brit. Faun.* p. 108; *Fries och Ekstr. Skand. Fisk.* p. 140, tab. 31; *Ekstr. Fische Mörkö*, p. 58; *Cuv. & Val.* xvi. p. 82, pl. 459 (not good); *Jenyns, Manual*, p. 402; *Yarrell, Brit. Fish.* 2nd edit. i. p. 355, and 3rd edit. ii. p. 364; *Nilss. Skand. Faun.* iv. p. 290; *Sélys-Longchamps, Faune Belge*, p. 200; *Kröyer, Danm. Fisk.* iii. p. 293; *Günther, Fische Neckar's*, p. 38; *Gronov. Syst.* ed. *Gray*, p. 179.

Crucian, *Penn. Brit. Zool.* iii. p. 319, pl. 72; *Yarrell, Brit. Fish.* i. edit. i. p. 311; *Couch, Fish. Brit. Isl.* iv. p 28, pl. 184.

Carassius vulgaris, (*Nilsson*) *Nordmann, in Demid. Voy. Russ. Mérid.* iii. p. 479; *Heckel & Kner, Süsswasserfische*, p. 67; *Dybowski, Cypr. Livl.* p. 41, tab. 2; *Jeitteles, Verhandl. zool.-bot. Gesellsch. Wien*, 1862, p. 295; *Siebold, Süsswasserfische*, p. 98; *Jäckel, Abhandl. zool.-miner. Ver. Regensb.* 1864, p. 22; *Canestrini, Arch. Zool. Anat. etc.* 1866, p. 66.

Cyprinopsis carassius, *Blanchard, Poiss. France*, p. 336.

Variety (Prussian Carp).

Cyprinus, sp., *Klein, Pisc. Miss.* v. tab. 11. fig. 2.

Cyprinus gibelio, *Bloch, Fische Deutschl.* i. p. 71, taf. 12; *Bl. Schn.* p. 438; *Lacép.* v. p. 64; *Ekström, Fische v. Mörkö*, p. 64; *Fleming, Brit. An.* p. 185; *Jenyns, Man.* p. 402; *Cuv. & Val.* xvi. p. 90; *Yarr. Brit. Fish.* 2nd edit. i. p. 358; 3rd edit. ii. p. 368; *Nordmann, l. c.*; *Koch, Faun. Ratisbon.* p. 32; *Sélys-Longchamps, Faun. Belge*, p. 199; *Heckel & Kner, Süsswasserfische*, p. 70; *Kessler, Bull. Soc. Nat. Mosc.* 1859, xxxii. pt. 1. p. 526; *Couch, Fish. Brit. Isl.* iv. p. 31, tab. 185.

—— amarus, *Koch, Faun. Ratisbon.* p. 39.

—— carassius, var., *Ekström, Oken's Isis* 1840, p. 145.

Carassius humilis, *Heckel, Wien. Ann.* ii. p. 156, taf. 9. fig. 4 *m.*

Cyprinus moles, *Agass. Mém. Soc. Sc. Nat. Neuchatel*, i. 1835, p. 37; *Cuv. & Val.* xvi. p. 89; *Sélys-Longchamps, l. c.* p. 200; *Heckel & Kner, l. c.* p. 71.

Cyprinus carassius, var. B, *Fries och Ekstr. Skand. Fisk.* p. 142, tab. 32 (*C. gibelio*).
Carassius oblongus, *Heckel & Kner, l. c.* p. 73; *Dybowski, Cyprin. Livl.* p. 50, taf. 3; *Jeitteles, Fische der March*, p. 25.
—— gibelio, *Jeitteles, Verhandl. zool.-bot. Gesellsch. Wien*, 1862, p. 295, and *Fische der March*, p. 24.
—— moles, *Jeitteles, Verhandl. zool.-bot. Gesellsch. Wien*, 1862, p. 295.
Cyprinopsis gibelio, *Blanchard, Poiss. France*, p. 340.

D. $\frac{3}{15-18}$. A. $\frac{3}{5-6}$. P. 13–14. L. lat. 31-35. L. transv. $\frac{7-8}{5-6}$. Vert. 19/13.

Dorsal and anal fins with the stiff ray rather feeble and finely serrated; caudal emarginate.

This species also is domesticated, and varies much, especially with regard to the depth of the body, which, normally, is one-third or two-fifths only of the total length, but frequently much less, particularly in localities with a scanty supply of food.

Central and Northern Europe; Italy; Siberia.

a. Adult. England. From Yarrell's Collection.
b, c. Adult: stuffed. England.
d–f. Adult: skins. England.
g. Adult: skin. Holland. From Gronow's Collection.
h. Adult. Holland. From Dr. Bleeker's Collection.
i-k. Adult. Neckar, near Heilbronn. From the Stuttgart Museum, as *C. moles*.
l–m. Large specimens. Danube. near Ulm. From the Stuttgart Museum, as *C. moles*.
n. Adult. Danube, near Ulm. From the Stuttgart Museum, as *Carassius vulgaris*.
o. Adult. Chiem Lake. Presented by Professor von Siebold.
p. Adult. Switzerland. From Professor L. Agassiz's Collection.
q–r. Adult. Fresh Haff. Presented by Professor von Siebold.
s. Adult. Presented by Professor von Siebold.
t. Adult. Gefle, Sweden. From Mr. Wheelwright's Collection.
u–w. Adult. Gestrickland, Sweden. From Mr. Wheelwright's Collection.
x–z. Young. Lake Wenern.
α. Adult: skeleton. Holland. Purchased of Mr. Damon.
β. Adult: skeleton. Würtemberg. From Dr. A. Günther's Collection.

Var. *gibelio*.

α–β. Adult and half-grown: skins. England.
γ. Several young specimens. Oldham. Pres. by D. Dyson, Esq.
δ. Several half-grown specimens. Braunsberg, Eastern Prussia. Presented by Professor von Siebold.

Var. *oblongus*.

ϵ. Half-grown. Norway. Presented by P. S. Godman, Esq.
ζ–η. Young. Baltic. Presented by Max., Prince of Neuwied.

θ. Several half-grown specimens. Munich. Presented by Professor von Siebold.

ι. Half-grown. Braunsberg, Eastern Prussia. Presented by Professor von Siebold.

κ–ν. Adult. Olmütz. From Herr Jeitteles's Collection.

Var. *humilis*.

ξ–ο. Young. Sicily.

Hybrid between Cyprinus carpio and Cyprinus carassius.

(*Carpio*, Heck.)

Cyprinus, sp., *Klein, Pisc. Miss.* v. p. 59. no. 3.

Cyprinus kollarii, *Heckel, Ann. Wien. Mus.* i. 1835, p. 223, taf. 19. fig. 2; *Nordmann in Demidoff, Voy. Russ. Mérid.* iii. 1840, p. 478, pl. 21. fig. 1; *Cuv. & Val.* xvi. p. 76, pl. 458.

—— striatus, *Hollandre, Faune de la Moselle*, p. 242; *Sélys-Longchamps, Faune Belge*, p. 198, pl. 9.

Carpio kollarii, *Heckel & Kner, Süsswasserf.* p. 64; *Kessler, Bull. Soc. Nat. Mosc.* 1859, xxxii. pt. 1. p. 523; *Dybowski, Cyprin. Livlands*, p. 55, taf. 5*; *Siebold, Süsswasserf.* p. 91.

D. $\frac{3}{17-20}$. A. $\frac{3}{5}$. L. lat. 35–38. L. transv. $\frac{6-7}{6-7}$. Vert. 35.

This hybrid resembles the Carp in having four barbels, which, however, are much less developed and smaller. The pharyngeal teeth generally in two series (4.1—1.4); sometimes the inner tooth is absent, or another tooth indicates the third series of the Carp. The serrated ray of the dorsal and anal fins varies in strength, being sometimes very feeble.

This hybrid appears to occur everywhere where the Common and Crucian Carps are kept in a domesticated or semidomesticated state.

a. Fine specimen, 16 inches long. Norwich. Presented by J. H. Gurney, Esq.

b. Adult. Holland. From Dr. Bleeker's Collection.

c. Adult. Brunswick. Presented by Professor von Siebold.

d. Adult. Schwandorf near Ratisbon. Presented by Professor von Siebold.—(Hybrid between *C. rex cyprinorum* and *C. carassius*.)

2. Carassius bucephalus.

Carassius bucephalus, *Heckel, Ann. Wien. Mus.* ii. p. 157.

D. 3/16. A. 3/5. P. 14. V. 9. L. lat. 32. L. transv. 8/5.

Very similar to *C. carassius*, but with more series of scales above the lateral line.

Warm springs near Salonik in Macedonia.

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* Dybowski appears to have been the first who proved the hybrid origin of this fish.

3. Carassius auratus.

Original variety.

?Cyprinus lineatus, *Cuv. & Val.* xvi. p. 96*.
Cyprinus langsdorfii, *Cuv. & Val.* xvi. p. 99.
—— gibelioides, *Cantor, Ann. & Mag. Nat. Hist.* 1842, ix. p. 485; *Richards. Ichthyol. Chin.* p. 292.
Carassius langsdorfii, *Schleg. Faun. Japon. Poiss.* p. 192, pl. 98. fig. 1.
—— bürgeri, *Schleg. l. c.* p. 194. fig. 2; *Richards. l. c.* p. 292; *Bleek. Act. Soc. Sc. Indo-Neerl.* viii. *Japan*, vi. p. 96.
—— cuvieri, *Schleg. l. c.* fig. 3; *Richards. l. c.*
—— grandoculis, *Schleg. l. c.* p. 195. fig. 4 (from a specimen badly fed).
Cyprinus carassoides (*Gray*), *Richards. l. c.* p. 291.
—— abbreviatus, *Richards. l. c.* p. 292 (monstros.).
Carassius pekinensis, *Basilewsky, Nouv. Mém. Soc. Nat. Mosc.* x. 1855, p. 229, tab. 3. fig. 3.
—— cæruleus, *Basilewsky, l. c.* tab. 9. fig. 2.
—— discolor, *Basilewsky, l. c.*

Domesticated varieties.

Goldfish.
Baster, Act. Harlem. vii. p. 246, c. tab.; *Kämpf, Geschichte von Japan*, i. p. 155; *Petiver, Gazophyl.* tab. 78. fig. 7; *Edward, Gleanings*, pl. 209.
Cyprinus, sp., *Klein, Pisc. Miss.* v. p. 60. no. 8; *Gronov. Zoophyl.* no. 342, p. 108, and *Mus. Ichthyol.* i. p. 3. no. 15, ii. no. 150; *Kölreuter, Act. Petropol. Nov.* ix. p. 420, tab. 9. figs. 1, 2.
Cyprinus auratus, *L. Syst. Nat.* i. p. 527; *Bl. Fische Deutschl.* iii. p. 132, taf. 93, 94; *Bl. Schn.* p. 439; *Lacép.* v. p. 553; *Yarrell, Brit. Fish.* i. p. 315, or 2nd edit. i. p. 358, or 3rd edit. ii. p. 371; *Cuv. & Val.* xvi. p. 101; *Basilewsky, Nouv. Mém. Soc. Nat. Mosc.* x. 1855. pl. 5; *Richards. Ichth. Chin.* p. 293.
—— mauritianus, *Benn. Proc. Comm. Zool. Soc.* i. 1830, p. 167.
—— thoracatus, *Cuv. & Val.* xvi. p. 97, pl. 460 (specimens introduced to Mauritius).
—— maillardi, *Guichenot, in Maillard, Notes sur l'île de la Réunion*, App. C, p. 14.
—— chinensis, *Gronov. Syst.* ed. *Gray*, p. 181.
Goldfish, *Pennant, Brit. Zool.* iii. p. 327; or ed. 1812, iii. p. 490.
Cyprinus telescopus, *Lacép.* v. p. 553, pl. 18. fig. 2.
—— macrophthalmus, *Bl. Ausländ. Fisch.* taf. 410.
—— quadrilobus, *Lacép.* v. pl. 18. fig. 3.
—— nukta, *Sykes, Trans. Zool. Soc.* ii. p. 355.
—— quadrilobatus, *Basilewsky, l. c.* p. 230, pl. 5. fig. 5.
Carassius auratus, *Bleeker, Cypr.* p. 255, and *Atl. Ichthyol. Cypr.* p. 74.
—— vulgaris, *var.* capensis, *Peters, Monatsber. Ak. Wiss. Berlin*, 1864, p. 393.

D. 19. A. 8. L. lat. 26. L. transv. 12. Vert. 18/13.

Barbels none. Dorsal and anal fins with the stiff ray rather strong and coarsely serrated; caudal emarginate.

The home of the Gold Carp or Goldfish is China and its islands and Japan; the wild breed has been described under various names,

* We suppose that "D. 4/23" is a misprint.

as it is not less subject to variation than the representative western species, *C. carassius.* There is no doubt that the Goldfish, which is now spread over nearly all the civilized parts of the world, is merely a domestic variety of the same fish. Although numerous examples of the Crucian and Goldfish are exactly alike in the shape of the body, the western species appears to have normally the body more elevated than the eastern, which also has less longitudinal series of scales above the lateral line.

a, b, c. Half-grown and young. China.
d, e–f, g–h, i–l. Adult, half-grown, and young. Chusan. From Dr. Cantor's Collection, as *Cyprinus nigrescens.*
m, n–r. Adult and half-grown. Formosa. From Consul Swinhoe's Collection.
s. Adult. Japan. From the Leyden Museum, as *C. langsdorfii.*
t–u. Half-grown. Japan. From the Leyden Museum, as *C. cuvieri.*
v. Young. Japan. From the Leyden Museum, as *C. bürgeri.*
w. Young. Japan. From Dr. Bleeker's Collection (*C. bürgeri*).
x. Adult. From the Haslar Collection.

Domesticated varieties.

a. Shape of body and fins normal.

a. Adult: skin. China. Presented by J. R. Reeves, Esq.
b. Half-grown. Canton.
c–e. Adult. India. Presented by W. Masters, Esq.
f. Many specimens. Azores. Presented by F. Godman, Esq.
g. Adult. England. Presented by Dr. A. Günther.
h. Half-grown. England. Presented by Mrs. Bennett.
i–k. Adult and half-grown: skins. From Gronow's Collection.
l, m, n–o. Adult and half-grown.
o′. Adult: skeleton.

β. Vertebral column deformed; fins perfect.

p. Several specimens. Bavaria. From Dr. Gemminger's Collection.

γ. Dorsal fin reduced to a serrated ray and some soft rays; the other fins normal.

q, r. Adult. Presented by S. Gray, Esq.
s. Adult: skin. River Tamar. From Yarrell's Collection.
t. Adult: stuffed.

δ. Dorsal fin reduced in size; anal spine double.

u. Adult: skin. From Gronow's Collection.
v. Adult. From the Collection of the Zoological Society.

ε. Dorsal fin absent; the other fins perfect.

w. Adult.
x. Adult: skin. From Gronow's Collection.

ζ. Caudal tri- or four-lobed; dorsal fin present.

y, z, α, β, γ–δ. Adult and half-grown. China.
ε. Young. Chusan. From Cantor's Collection.

η. Caudal tri- or four-lobed; dorsal fin none; eyes normal.

η, θ–ι, κ–μ. Adult, half-grown, and young. China.
ν. Adult. Siam. Presented by Sir R. Schomburgk.

θ. Caudal fin trilobed; dorsal none; eyes very large, protruding.

ξ–ο. Adult. Ningpo. From Mr. Fortune's Collection.

7. CATLA.

Catla, *Cuv. & Val.*
Gibelion, *Heckel, in Russegger's Reisen*, i. p. 1014.

Scales of moderate size. Dorsal fin without osseous ray, with more than nine branched rays, commencing nearly opposite the ventrals; anal fin short. Snout broad, with the integuments very thin; there is no upper lip, the lower with a free continuous posterior margin. Symphysis of the mandibulary bones loose, without prominent tubercle. Mouth anterior. Barbels none. Lateral line running along the middle of the tail. Gill-rakers very long, fine, and closely set. Pharyngeal teeth 5.3.2—2.3.5.

East-Indian continent.

1. Catla buchanani.

Cyprinus catla, *Ham. Buch. Fish. Gang.* pp. 287, 318, 387, pl. 13. fig. 81; *M'Clell. Ind. Cypr.* pp. 275, 348.
Leuciscus catla, *Valenc. in Bélang. Voy. Ind. Orient.* p. 379, pl. 3. fig. 2.
Catla buchanani, *Cuv. & Val.* xvii. p. 411, pl. 515; *Bleek. Verh. Bat. Gen.* xxv. *Beng. & Hind.* p. 142; *Hyrtl, Sitzgsber. Ak. Wiss. Wien*, 1864, xlix. p. 161 (structure of pharynx.)

D. 17–19. A. 7. L. lat. 40–41. L. transv. 7–8/9.

Head very large and broad, its length being equal to the height of the body, which is about one-third of the total (without caudal). Five and a half longitudinal series of scales between the lateral line and the root of the ventral fin. Caudal fin deeply forked. Coloration uniform.

Bengal, Assam.

a–f. Stuffed, from 10 to 36 inches long. Bengal.
g–h. Stuffed, 12 inches long. Ferozepore. From Griffith's collection.
i. Young. River Hooghly. From Dr. Bleeker's collection. Without pharyngeal bones.
k Very young. Ganges. Presented by G. R. Waterhouse, Esq.
l. Pharyngeal bones of a specimen, 9 inches long, from Calcutta. Collected by Messrs. von Schlagintweit.

8. CIRRHINA*.

Cirrhina, *Cuv. Règne An.*
Cirrhina, sp., *Cuv. & Val.*
Cyrene, sp., *Heckel, in Russegger's Reisen*, ii. 3. p. 284.
Mrigala, sp., *Bleeker.*

Scales of moderate or large size. Dorsal fin without osseous ray, with from thirteen to seventeen rays, commencing in advance of the ventrals. Snout depressed, obtusely rounded or subtruncated, with the soft parts very thin; mouth transverse; lower jaw rather sharp, with a very thin lip; the sharp edge of the lower jaw without horny substance. A small tubercle on the inner side of the symphysis of the mandible; upper lip not fringed. Barbels small, four, or two, or none; if two, the upper alone are present. Lateral line in the middle of the tail. Anal scales not enlarged. Anal fin short. Pharyngeal teeth 5 . 4 or 3 . 2—2 . 3 or 4 . 5.

East-Indian continent.

1. Cirrhina mrigala.

Cyprinus mrigala, *Ham. Buch. Fish. Gang.* pp. 279, 386, pl. 6. fig. 79; *M'Clell. Ind. Cypr.* pp. 276, 350.
Cirrhina rubripinnis, *Cuv. & Val.* xvi. p. 288, pl. 479.
—— mrigala, *Cuv. & Val.* xvi. p. 294
Mrigala buchanani, *Bleek. Prodr. Cypr.* p. 226 (name only).

D. 15–16. A. 8. L. lat. 42–43. L. transv. 7/9.

Generally the upper barbels only are present and shorter than the eye, the lower being rudimental or absent; lower lip none or indistinct; pores on the snout small. The origin of the dorsal fin is nearer to the end of the snout than to the root of the caudal in adult specimens, but nearly equidistant from both in young ones; it is opposite the twelfth scale of the lateral line. There are five longitudinal series of scales between the lateral line and ventral fin. The height of the body is one-fourth of the total length (without caudal), the length of the head one-fourth or one-fifth. Coloration uniform.

Bengal, Hindostan.

a. Half-grown. Calcutta. Presented by Th. Moore, Esq.

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* 1. Cirrhina plumbea, *C. & V.* xvi. p. 289.—Irawaddy.—D. 16. L. lat. 40.
2. Cirrhinus rubro-punctatus, *Jerdon, Madr. Journ. Lit. & Sc.* xv. 1849, p. 303.—Cavery River.—D. 15. L. lat. 40. To be compared with *C. mrigala.*
3. —— affinis, *Jerdon, l. c.*—Cavery River.—D. 17. L. lat. 39. Said to have long barbels.
4. Chondrostoma kawrus, *Sykes, Trans. Zool. Soc.* ii. p. 358, tab. 62. fig. 2.—Beema River.—D. 13.
5. Cyprinus bata, *Ham. Buch.* p. 283; ? = Cyprinus acra, *Ham. Buch.* p. 284 = Cyprinus cura, *Ham. Buch.* p. 284; ? Gobio lissorhynchus, *M'Clell. Ind. Cypr.* p. 355, tab. 55. fig. 5 (very bad).—Bengal and Assam.—D. 13, in Hamilton's original drawing; said to be without barbels.
6. Chondrostoma boggut, *Sykes, l. c.* p. 359.—Dekkan.—D. evidently 13.
7. Varicorhinus bobree, *Sykes, l. c.* p. 355.—Dekkan.—D. 17.

b–h. Stuffed; from 8 to 24 inches long. India.
i–k. Young. India. Presented by G. R. Waterhouse, Esq.
l. Young. Indus. From the collection of Messrs. von Schlagintweit.

2. Cirrhina leschenaultii.

? Cyprinus cirrhosus, *Bl.* xii. p. 52, taf. 411 (bad).
Dangila leschenaultii, *Cuv & Val.* xvi. p. 235, pl 471 (not good).
? Cirrhina blochii, *Cuv. & Val.* xvi. p. 290.
Cirrhinus cuvierii, *Jerdon, Madr. Journ. Lit. & Sc.* xv. 1849, p. 304.

D. 17. A. 8. L. lat. 42. L. transv. 8/9.

The upper barbels are longer than the lower, and shorter than the eye. Lower lip distinct; pores on the snout small. The origin of the dorsal fin is much nearer to the end of the snout than to the root of the caudal, and opposite to the tenth scale of the lateral line. There are four and a half longitudinal series of scales between the lateral line and ventral fin. The height of the body is two-sevenths of the total length (without caudal), the length of the head two-ninths. Coloration uniform.

Peninsula of India.

a–b. Fourteen inches long. River Cavery. Presented by Capt. Mitchell.

3. Cirrhina chinensis.

Closely allied to *C. mrigala.*

D. 16. A. 8. L. lat. 38–39. L. transv. 7–8/7½.

Generally the upper barbels only are present; they are shorter than the eye; sometimes rudimental lower barbels. Lower lip distinct; snout without pores. Operculum twice as high as long. The origin of the dorsal fin is much nearer to the end of the snout than to the root of the caudal, and opposite to the ninth scale of the lateral line. There are four and a half longitudinal series of scales between the lateral line and ventral fin. The height of the body is contained thrice and one-fourth or thrice and one-third in the total length (without caudal), the length of the head five times or five times and a third. Caudal fin very deeply forked, the length of the middle rays being nearly one-fourth of the outer longest. Coloration uniform bright silvery.

China.

a. Seven and a half inches long. China. Presented by J. R. Reeves, Esq.
b–e. Nine and ten inches long. From the Haslar Collection.

This species would appear to agree well with the *C. mrigala* of Hamilton Buchanan; but he intended to describe the Mrigala, a common fish of the Bengal provinces, whilst this species is, at present, known from China only. Therefore it is more probable that the figure given by Hamilton Buchanan is not quite correct, than that it represents our fish.

4. Cirrhina anisura.

Gobio anisurus, *M'Clell. Ind. Cypr.* p. 360, tab. 40. fig. 2.
Cirrhina anisura, *Steindachner*, *Sitzgsb. Ak. Wiss. Wien*, 1867, lvi. p.

D. 13. A. 7. L. lat. 43–44. L. transv. $\frac{9\frac{1}{2}-10\frac{1}{2}}{?}$.

Barbels none. The length of the head is nearly equal to the height of the body, and contained four times and one-third in the total length (without caudal); the diameter of the eye is one-fourth of the length of the head, and much less than that of the snout.

Bengal.

5. Cirrhina dyochilus.

The Goreah of the Assamese.
Labeo (Cyprinus) dyocheilus, *M'Clell. Ind. Cypr.* pp. 268, 330, tab. 37. fig. 1.

D. 13. A. 7. L. lat. 42. L. transv. 8/8.

Barbels none, or quite rudimental. Lower lip distinct; snout with pores. The origin of the dorsal fin is nearer to the end of the snout than to the root of the caudal, and opposite to the tenth scale of the lateral line. There are five longitudinal series of scales between the lateral line and the ventral fin. Coloration uniform silvery.

Assam.

a. Four and a half inches long. Cachar. Presented by Lieut.-Col. Playfair.

9. DANGILA*.

Dangila, sp., *Cuv. & Val.*, *Bleeker.*
Cyrene, sp., *Heckel*, *in Russegger's Reisen*, ii. 3. p. 284.

Scales of small, moderate, or large size. Dorsal fin without osseous ray, with from twenty-six to thirty-three rays, commencing in advance of the ventrals. Snout more or less depressed, obtusely rounded or subtruncated; mouth transverse, inferior or subinferior. Lower jaw with a continuous thin free lip, covering the edge of the mandible, which is rather sharp; a small tubercle on the inner side of the symphysis of the mandible. Upper lip fringed. Barbels small, four. Lateral line running along the middle of the tail. Anal fin short. Pharyngeal teeth 5 . 4 or 3 . 2—2 . 3 or 4 . 5.

Snout frequently with horny tubercles, which are periodically lost, leaving their bases as shallow round depressions (pores).

East-Indian archipelago.

1. Dangila ocellata.

Cyrene ocellata, *Heckel*, *in Russegger's Reisen*, i. p. 1025.
Dangila microlepis, *Bleek. Nat. Tydschr. Ned. Ind.* iii. p. 595.

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* 1. Dangila berdmorei, *Blyth*, *Journ. As. Soc. Beng.* 1860, p. 162.—Sitang River (Tennasserim).

Dangila ocellata, *Bleek. l. c.* xiv. p. 475; *Prodr. Cypr.* p. 194; or *Atl. Ichthyol. Cypr.* p. 43, tab. 16. fig. 3.

D. 32. A. 8 L. lat. 65–67. L. transv. 15/15.

The lower barbels are rather longer than the upper, but shorter than the eye. Lower lip distinct; a few conspicuous pores anteriorly on the snout. The origin of the dorsal fin is opposite the twelfth scale of the lateral line. There are ten longitudinal series of scales between the lateral line and the root of the ventral fin. The height of the body is contained thrice and one-half in the total length (without caudal); the length of the head four times and two-thirds. A black spot, edged with yellow below the lateral line, opposite its tenth scale; another on the end of the lateral line.

Sumatra and Borneo.

a. Seven and a half inches long. From Dr. Bleeker's Collection.

2. Dangila tæniata.

Dangila fasciata *, *Bleek. Nat. Tydschr. Ned. Ind.* iv. p. 297; or *Prodr. Cypr.* p. 195; or *Atl. Ichthyol. Cypr.* p. 44, tab. 16. f. 2.

D. 30.–33. A. 8. L. lat. 50. L. transv. 9/9.

The lower barbels are longer than the upper, and than the eye. Lower lip distinct; conspicuous pores anteriorly on the snout, disposed in transverse series. The origin of the dorsal fin is opposite the tenth scale of the lateral line. There are five and a half longitudinal series of scales between the lateral line and the root of the ventral fin. The height of the body is two-sevenths of the total length (without caudal), the length of the head one-fifth. A brownish streak along each series of scales, that of the lateral line more distinct than the others; the upper and lower margins of the caudal fin dark violet.

Sumatra and Borneo.

a. Type of the species in not good state. From Dr. Bleeker's Collection.

3. Dangila cuvieri.

Dangila cuvieri, *Cuv. & Val.* xvi. p. 230, pl. 470.
—— leptocheila, *Cuv &. Val.* xvi. p. 234; *Bleek. Prodr. Cypr.* p. 198; or *Atl. Ichthyol. Cypr.* p. 45, tab. 17. fig. 1.

D. 26–30. A. 7. L. lat. 39. L. transv. $6\frac{1}{2}/5\frac{1}{2}$.

The lower barbels are much longer than the upper, or than the eye. Lower lip distinct; snout with two transverse series of small pores anteriorly. The origin of the dorsal fin is opposite the ninth scale of the lateral line. There are three and a half longitudinal series of scales between the lateral line and the root of the ventral fin. The height of the body is contained thrice and a half or thrice and two-thirds in the total length (without caudal), the length of the head five times and a third or five times and a half. Coloration uniform.

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* This species has no *fasciæ*, but *tæniæ*.

Java, Sumatra, Borneo.

a. Nine inches long. From Dr. Bleeker's Collection.

4. Dangila kuhlii.

Dangila kuhlii, *Cuv. & Val.* xvi. p. 231; *Bleek. Prodr. Cypr.* p. 197; or *Atl. Ichthyol. Cypr.* p. 44, tab. 16. fig. 1.

D. 26–28. A. 7. L. lat. 39. L. transv. 7–7½/7.

The lower barbels are much longer than the upper, or than the eye. Lower lip distinct; snout with two or three transverse series of pores anteriorly. The origin of the dorsal fin is opposite the ninth scale of the lateral line. There are four and a half longitudinal series of scales between the lateral line and the root of the ventral fin. The height of the body is contained thrice and a half in the total length (without caudal), the length of the head four times and a third. A blackish spot on the end of the lateral line frequently lost in preserved specimens.

Batavia.

a, b. Four and five inches long.

5. Dangila sumatrana.

? Cyrene philippinia, *Heckel, in Russegger's Reisen*, i. p. 1025.
Dangila sumatrana, *Bleek. Nat. Tydschr. Ned. Ind.* iii. p. 596; or *Prodr. Cypr.* p. 200; or *Atl. Ichthyol. Cypr.* p. 46, tab. 15. fig. 2.

D. 26. A. 7. L. lat. 37–38. L. transv. 5½/6.

The lower barbels are much longer than the upper, and even than the eye. Lower lip distinct; snout with three transverse series of pores anteriorly. The origin of the dorsal fin is opposite the ninth scale of the lateral line. There are four longitudinal series of scales between the lateral line and the ventral fin. The height of the body is one-fourth of the total length (without caudal), the length of the head one-fifth. A narrow brownish band along the lateral line.

Sumatra; ? Philippine Islands.

a. Type of the species, 7 inches long, in not good state. Sumatra. From Dr. Bleeker's Collection.

6. Dangila festiva.

Cyrene festiva, *Heckel, in Russegger's Reisen*, i. p. 1025.
Dangila festiva, *Bleek. in Act. Soc. Sc. Indo-Neerl.* ii. *Borneo*, x. p. 16; or *Prodr. Cypr.* p. 202; or *Atl. Ichthyol. Cypr.* p. 47, tab. 15. fig. 4.

D. 26. A. 7. L. lat. 33. L. transv. 7½/7.

The lower barbels are much longer than the upper, or than the eye. Lower lip distinct; snout with two transverse series of large pores anteriorly. The origin of the dorsal fin is opposite the eighth scale of the lateral line. There are five longitudinal series of scales between the lateral line and the ventral fin. The height of the body is contained thrice and a half in the total length (without caudal), the length of the head four times and a third or four times. Coloration uniform: upper margin of the dorsal fin and a band along the middle of each caudal lobe blackish.

Borneo.

a. Kahajan. From Dr. Bleeker's Collection.

10. OSTEOCHILUS *.

Rohita, sp., *Cuv. & Val.*, *Blkr.*

Scales rather large. Dorsal fin without osseous ray, with from thirteen to twenty-one rays, commencing in advance of the ventrals. Snout obtusely rounded, maxillary region scarcely thickened, and but slightly projecting beyond the mouth. Mouth transverse, inferior or subinferior, with the lips more or less thickened, fringed or crenulated; instead of the inner fold, as described in *Labeo*, the osseous part of the mandible forms a hard sharp transverse prominence; no symphysial tubercle. Barbels small, nearly always four. Anal scales not enlarged. Anal fin very short. Pharyngeal teeth 5 . 4 2—2 . 4 . 5.

Snout sometimes with horny tubercles which periodically fall off, leaving their former bases as shallow round depressions (pores).

East-Indian archipelago.

1. Osteochilus melanopleurus.

Rohita melanopleura, *Bleek. Nat. Tydschr. Ned. Ind.* iii. p. 430; or *Prodr. Cypr.* p. 163; or *Atl. Ichthyol. Cypr.* p. 62, tab. 13.

D. 19–21. A. 7. L. lat. 45–55. L. transv. 11–12/11.

Seven or eight longitudinal series of scales between the lateral line and ventral fin. Snout without pores. Barbels well developed, much longer than the eye, which occupies the middle of the length of the head. The height of the body is contained twice and two-thirds in the total length (without caudal), the length of the head thrice and one-fourth or four times. Body with numerous small silvery spots irregularly scattered ; a large black transverse blotch on the middle of the side of the abdomen.

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* 1. Labeo cephalus, *C. & V.* xvi. p. 347, pl. 487.—Pegu.—D. 16. L. lat. 36.—The reason why I am inclined to refer this fish to the present genus, is because Valenciennes describes its mouth thus: "La mâchoire inférieure a son bord droit taillé en biseau transversal." Valenciennes's genus *Rohita* is very distinct from *Osteochilus*, although it contains three or four species of the latter. The genus here proposed agrees more with *Rohita* (Blkr.), but this ichthyologist has mixed up many other species which I consider to be *Labeones*; he also does not allude to the peculiarity of the genus, viz. the sharp lower jaw, inside the lip, nor has he observed that this genus appears to be restricted to the Archipelago.

2. Dangila lipocheila, *C. & V.* xvi. p. 232 (part.); *Bleek. Prodr. Cypr.* p. 205, and *Atl. Ichthyol. Cypr.* p. 48, tab. 7. fig. 1.—Java.—Bleeker says that this name was first given by Kuhl and Van Hasselt to a fish of which they have left a drawing copied by Bleeker; it would appear to have D. 2/18 and L. lat. 32. Bleeker thinks that it has been confounded by Valenciennes with *Barbichthys lævis*, with which his description agrees better, than with the *D. lipocheilus* of Kuhl and Van Hasselt.

3. Cyrene cyanoparcia, *Heckel, in Russegger's Reisen*, i. p. 1025.—Philippine Islands.—D. 20. L. lat. 35.

Sumatra, Borneo; Siam.

a. One of the typical specimens. From Dr. Bleeker's Collection.
b. Half-grown. Siam. From M. Mouhot's Collection.

2. Osteochilus borneensis.

Rohita borneensis, *Bleek. Act. Soc. Sc. Ind.-Neerl.* ii. *Borneo*, x. p. 17; or *Prodr. Cypr.* ii. p. 164; or *Atl. Ichthyol. Cypr.* p. 63, tab. 8. fig. 5.

B. 20. A. 7. L. lat. 47. L. transv. 8/9.

Six and a half longitudinal series of scales between the lateral line and the ventral fin. Snout with five pores in front, that in the centre being the largest. Barbels at least as long as the eye, which occupies the middle of the length of the head. The height of the body is one-third of the total length (without caudal), the length of the head two-sevenths. A large blackish spot on the root of the caudal fin.

Borneo.

a. Type of the species, 3 inches long. Pontianak. From Dr. Bleeker's Collection.

3. Osteochilus hasseltii.

Rohita hasseltii, *Cuv. & Val.* xvi. p. 274; *Bleek. Nat. Tydschr. Ned. Ind.* v. p. 450; or *Prodr. Cypr.* p. 171; or *Atl. Ichthyol. Cypr.* p. 65, tab. 14. fig. 1.
—— leiorhynchos, *Bleek. Verh. Bat. Gen.* xxiii. *Midd. Oost-Java*, p. 19.
—— artedii, *Bleek. Nat. Tydschr. Ned. Ind.* i. p. 434.

D. 18–19. A. 7. L. lat. 35. L. transv. $\frac{5\frac{1}{2}-6}{6}$.

Four longitudinal series of scales between the lateral line and the ventral fin. Snout without pores. The upper barbels are about one-third the size of the lower ones, which are longer than the eye. Eye nearer to the end of the snout than to that of the operculum. The height of the body is contained from twice and two-thirds to thrice in the total length, the length of the head four times and a half, or in large examples five times and a half. Young and half-grown examples nearly always, adult sometimes, with about six series of brown spots on the tail, one spot being on every scale. A round black spot on the middle of the root of the caudal fin, disappearing in old examples.

Java, Sumatra, Borneo.

a, b, c–e. Adult, half-grown, and young. East-Indian archipelago.

4. Osteochilus kappenii.

Rohita kappenii, *Bleek. Act. Soc. Sc. Indo-Neerl.* ii. *Borneo*, x. p. 19; or *Prodr. Cypr.* p. 167; or *Atl. Ichthyol. Cypr.* p. 64, tab. 12. fig. 1.

D. 18. A. 7. L. lat. 32. L. transv. $5\frac{1}{2}/6\frac{1}{2}$.

Four longitudinal series of scales between the lateral line and ventral fin. Snout without pores. The upper barbels only half as long as the lower, which are as long as the eye. Eye in the middle of the length of the head. The height of the body is contained twice and three-fifths in the total length (without caudal), the length of the head four times and one-fourth. A large black blotch on the root of the caudal fin.

Borneo.

a. Type of the species, 5 inches long. Pontianak. From Dr. Bleeker's Collection.

5. Osteochilus kuhlii.

Rohita kuhlii, *Bleek. Prodr. Cypr.* p. 177; or *Atl. Ichthyol. Cypr.* p. 68, tab. 12. fig. 3.

D. 17. A. 8. L. lat. 33. L. transv. $4\frac{1}{2}/5$.

Three longitudinal series of scales between the lateral line and ventral fin. Snout without pores. The upper barbels are one-third the size of the lower, which are longer than the orbit. Eye somewhat nearer to the end of the snout than to that of the opercle. The height of the body is one-third of the total length (without caudal), the length of the head two-ninths. A large blackish spot on the end of the tail.

Sumatra.

a. Type of the species, 6 inches long. Palembang. From Dr. Bleeker's Collection.

6. Osteochilus schlegelii.

Rohita schlegelii, *Bleek. Nat. Tydschr. Ned. Ind.* ii. p. 423, & ix. p. 426; *Prodr. Cypr.* p. 169; or *Atl. Ichthyol. Cypr.* p. 65, tab. 15. fig. 3.

D. 16. A. 7. L. lat. 35. L. transv. $6\frac{1}{2}/7\frac{1}{2}$.

Five longitudinal series of scales between the lateral line and ventral fin. Snout without pores. Barbels not well developed, shorter than the eye, which is in, or in young examples before, the middle of the length of the head. The height of the body is contained twice and four-fifths in the total length (without caudal), the length of the head four times and one-fourth. Frequently an indistinct very large blackish blotch anteriorly on the dorsal fin.

Sumatra and Borneo; Siam.

a. One of the typical specimens. From Dr. Bleeker's Collection.
b. Half-grown. Borneo. From the Leyden Museum.
c. Half-grown. Siam. Purchased of Mr. Jamrach.

7. **Osteochilus waandersii.**

Rohita waandersi, *Bleek. Nat. Tydschr. Ned. Ind.* iii. p. 733; or *Prodr. Cypr.* p. 166; or *Atl. Ichthyol. Cypr.* p. 63, tab. 9. fig. 2.

D. 15. A. 7. L. lat. 35. L. transv. 6½/7.

Four and a half longitudinal series of scales between the lateral line and ventral fin. Snout without pores. Barbels moderately developed, the lower as long as the eye, which occupies the middle of the length of the head. The height of the body is contained thrice and one-fifth in the total length (without caudal), the length of the head four times and one-fourth. A black band, as broad as a scale, runs along the lateral line to the end of the middle caudal rays.

Banka.

a. Type of the species, 8 inches long. Toboali. From Dr. Bleeker's Collection.

8. **Osteochilus microcephalus.**

?? Rohita microcephalus, *Cuv. & Val.* xvi. p. 275.
Rohita microcephalus, *Bleek. Prodr. Cypr.* p. 173; or *Atl. Ichthyol. Cypr.* p. 66, tab. 11. fig. 1.

Most closely allied to *O. waandersii.*

D. 14. A. 7. L. lat. 33. L. transv. 5½/6.

Four and a half longitudinal series of scales between the lateral line and ventral fin. Snout without pores. The upper barbels are half the size of the lower, which are longer than the eye. Eye nearly equidistant from the end of the snout and opercle. The height of the body is contained thrice or thrice and one-fourth in the total length (without caudal), the length of the head four times and one-third or four times and a half. A blackish band runs along the lateral line.

Java and Sumatra.

a. One of the typical specimens. From Dr. Bleeker's Collection.

9. **Osteochilus brachynotopterus.**

Rohita brachynotopterus, *Bleek. Nat. Tydschr. Ned. Ind.* ix. p. 266; or *Prodr. Cypr.* i. p. 122; or *Atl. Ichthyol. Cypr.* p. 67, tab. 8. fig. 6.

D. 13. A. 7. L. lat. 33. L. transv. 5½/6.

Four longitudinal series of scales between the lateral line and ventral fin. Snout without pores. The upper barbels are one-third the size of the lower, which are longer than the eye. The eye occupies the middle of the length of the head. The height of the body is contained thrice and a half in the total length (without caudal), the length of the head four times and one-fifth. A narrow dark band runs along the lateral line, but disappears in preserved specimens

Sumatra.

a. Type of the species, 3½ inches long. Lahat. From Dr. Bleeker's Collection.

10. Osteochilus vittatus.

Rohita vittata, *Cuv. & Val.* xvi. p. 267; *Bleek. Nat. Tydschr. Ned. Ind.* v. p. 451; or *Prodr. Cypr.* p. 178; or *Atl. Ichthyol. Cypr.* p. 68, tab. 12. fig. 2.

—— erythrura, *Cuv. & Val.* xvi. p. 268; *Bleek. Nat. Tydschr. Ned. Ind.* v. p. 452.

—— enneaporus, *Bleek. l. c.* iii. p. 596; or *Prodr. Cypr.* p. 184; or *Atl. Ichthyol. Cypr.* p. 70, tab. 11. fig. 2.

D. 15. A. 8. L. lat. 35–36. L. transv. 5½/6.

Four longitudinal series of scales between the lateral line and ventral fin. Snout with pores or tubercles in front, the three largest being placed in a transverse series (• . •), and the central being the largest; there are sometimes other smaller pores surrounding the larger ones. Barbels moderately developed, about as long as the eye, which occupies nearly the middle of the length of the head. The height of the body is contained thrice and one-fourth in the total length (without caudal), the length of the head five times. Generally a dark band along the lateral line.

Java, Sumatra, Borneo.

a. Adult. From Dr. Bleeker's Collection.

b. Type of *R. enneaporos*, 9 inches long. Padang. From Dr. Bleeker's Collection.

11. Osteochilus triporus.

Rohita triporus, *Bleek. Nat. Tydschr. Ned. Ind.* iii. p. 598; or *Prodr. Cypr.* p. 182; or *Atl. Ichthyol. Cypr.* p. 70, tab. 11. fig. 3.

D. 14–15. A. 7. L. lat. 33. L. transv. 5½/6½.

Four longitudinal series of scales between the lateral line and ventral fin. Snout with three pores in front, situated in a transverse line, the middle being the largest. The upper barbels are one-third the size of the lower, which are as long as the eye. Eye nearly in the middle of the length of the head. The height of the body is contained thrice and one-fifth in the total length (without caudal), the length of the head four times and a half.

Sumatra and Borneo.

a. One of the typical specimens. From Dr. Bleeker's Collection.

12. Osteochilus kahajanensis.

Rohita kahajanensis, *Bleek. Act. Soc. Sc. Indo-Neerl.* ii. *Borneo*, x. p. 18; or *Prodr. Cypr.* p. 180; or *Atl. Ichthyol. Cypr.* p. 69, tab. 8. fig. 1.

D. 18. A. 7. L. lat. 34. L. transv. 5½/7.

Four longitudinal series of scales between the lateral line and ventral fin. A large pore on each side in front of the snout. The upper barbels are only half the size of the lower, which are as long as the eye. Eye occupying the middle of the length of the head. The height of the body is contained thrice and one-fifth in the total length (without caudal), the length of the head four times and a half. A blackish spot behind the upper end of the gill-opening; a large blackish blotch on the end of the tail.

Borneo and Sumatra.

a. Type of the species. From Dr. Bleeker's Collection.

13. **Osteochilus oligolepis.**

Rohita oligolepis, *Bleek. Nat. Tydschr. Ned. Ind.* v. p. 191; or *Prodr. Cypr.* p. 185; or *Atl. Ichthyol. Cypr.* p. 71, tab. 8. fig. 7.

D. 14. A. 7. L. lat. 28–30. L. transv. 4½/5½.

Snout with numerous pores. Barbels well developed, longer than the eye, which is in the middle of the length of the head. The height of the body is contained thrice and one-fifth in the total length (without caudal), the length of the head four times and one-third. A blackish spot on the middle of the end of the tail.

Banka.

a. One of the typical specimens, in bad state. Marawang. From Dr. Bleeker's Collection

14. **Osteochilus spilurus.**

Dangila spilurus, *Bleek. Nat. Tydschr. Ned. Ind.* i. p. 272; or *Prodr. Cypr.* p. 206; or *Atl. Ichthyol. Cypr.* p. 48, tab. 15. fig. 1.

D. 13. A. 7. L. lat. 30. L. transv. 4½/4½.

The lower barbels are much longer than the upper or than the eye*. Lower lip distinct; snout with some pores anteriorly. The origin of the dorsal fin is opposite the ninth scale of the lateral line. There are three longitudinal series of scales between the lateral line and the ventral fin. The height of the body is contained thrice and two-thirds in the total length (without caudal), the length of the head four times and one-third. A round blackish spot on the end of the lateral line.

Borneo.

a. Type of the species, 3 inches long, in bad state. Bandjermassing. From Dr. Bleeker's Collection.

11. **LABEO** †.

Labeo, *Cuv. Règne Anim.*; *Heckel in Russegger's Reisen*, ii. 3. p. 294.

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* This is erroneously represented in the figure quoted.

† 1. Labeo selti, *C. & V.* xvi. p. 345.—Senegal.
2. Cirrhina brevieeps, *C. & V.* xvi. p. 293.—Bantam River. Cfr. *Bleeker, Atl. Ichthyol. Cypr.* p. 54.
3. Cyprinus pausio, *Ham. Buch. Fish. Gang.* pp. 317, 389; *M'Clell. Ind. Cypr.* tab. 42. fig. 4 (cop. from Hamilton's MS.).—River Kosi.
4. —— joalius, *Ham. Buch. l. c.* pp. 316, 389; *M'Clell. l. c.* p. 327.—Bengal.—According to the unpublished figure. D. 13; scales small.
5. Rohita reynauldi, *C. & V.* xvi. p. 247, pl. 474.—Rangoon.—D. 18. L. lat. 44.
6. —— rostellatus, *C. & V.* xvi. p. 256.—Irawaddy D. 20.

Rohita, sp., et Labeo. sp. *Cuv. & Val.**
Tylognathus, sp., *Heckel.*
Hypselobarbus, sp., Tambra, Labeo, Diplocheilus, Diplocheilichthys, Rohita, sp., Lobocheilus, sp., Tylognathus, sp., Rohitichthys, et Morulius, *Bleeker* *

Scales of moderate or small size. Dorsal fin without osseous ray, with more than nine branched rays, commencing somewhat in advance of the ventrals. Snout obtusely rounded, the skin of the maxillary region being more or less thickened, forming a projection beyond the mouth. Mouth transverse, inferior, with the lips thickened, each or one of them being provided with an inner transverse fold, which is covered with a deciduous horny substance forming a sharp edge, which, however, does not rest upon the bone as base, but is soft and moveable. Barbels very small, two or four, the maxillary barbels more or less hidden in a groove behind the angle of the mouth. Anal scales not enlarged. Anal fin very short. Pharyngeal teeth uncinate. 5 . 4 . 2—2 . 4 . 5. Snout generally more or less covered with hollow tubercles.

Fresh waters of tropical Africa and of the East Indies.

The *skeleton* of *Labeo* resembles much that of *Barbus*; every part of it is solid, and well ossified. Occipital crest prominent, firmly united with the neural spines of the anterior vertebræ, and strengthened on each side by a lower lateral crest. A series of irregular broad interneural elements runs from the occipital crest to the origin of the dorsal fin, giving much strength to this part of the vertebral column. The lower apophyses for the attachment of the air-bladder and ossicula auditus are very strong, and have their base dilated and honeycombed. The mandible is feeble, styliform, with its anterior

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7. Labeo dussumieri, *C. & V.* xvi. p. 350 (Rohita valenciennesi, *Blkr.*).—Calcutta.—D. 15. L. lat. 42. To be compared with *L. rohita.*
8. —— reynauldi, *C. & V.* xvi. p. 351.—Rangoon.—D. 16. L. lat. 40.
9. —— fimbriatus, *C. & V.* xvi. p. 353 (Rohita bengalensis, *Blkr.*).—Bengal.—D. 15. L. lat. 41. To be compared with *L. rohita.*
10. Cyprinus abramioides, *Sykes, l. c.* p. 353, tab. 61. fig. 2; Hypselobarbus (Tambra) abramioides, *Blkr. Prodr. Cypr.* p. 275 (name only).—Dekkan.—D. 20. The height of the body is contained twice and one-third in the total length (without caudal); it is said to be without barbels.
11 Cyprinus angra, *Ham. Buch. Fish. Gang.* p. 331; Cyprinus (Bangana) hamiltonii, *Gray, Ind. Zool.*; ? Gobio ancra, *M'Clell. Ind. Cypr.* p. 354.—Brahmaputra.—Scales of moderate size.—D. 13. A black band along the middle of the side.
12. Gobio angroides, *Jerdon, Madr. Journ. Lit. & Sc.* xv. 1849, p. 307.—Peninsula of India.—D. 13. L. lat. 44.
13. Leuciscus molitorella, *C. & V.* xvii. p. 359; *Richards. Ichth. Chin.* p. 296.—China.—Known from drawings only. D probably 15, large, elevated. A blue blotch above the pectoral fin.

* To give an idea on what characters these so-called genera are founded, we may mention that, for instance, Valenciennes distinguishes *Labeo* from *Rohita* by entire (not fringed) lips, but subsequently describes an entire series of species of *Labeo* with fringed lips. Probably several species are described by him under different names, once as *Labeo*, and again as *Rohita*. Bleeker cannot have examined *L. niloticus* (the type of *Labeo*, Cuv.!), or he would have found it agreeing better with *Morulius* (Blkr.) than with *Labeo* (Blkr.) &c.

portion rectangularly bent inwards towards the symphysis. Number of vertebræ in *L. niloticus* 26 abdominal and 15 caudal; in *L. forskalii* 23 abdominal and 16 caudal. The inward-directed ridges of the humeral arch are much dilated, rendering the pharyngeal passage very narrow.

Synopsis of the Species.

A. L. lat. less than 50.
  1. African species.
    a. More than thirteen dorsal rays, p. 47.
    b. Thirteen dorsal rays, p. 50.
  2. Indian species.
    a. More than thirteen dorsal rays, p. 51.
    b. Thirteen dorsal rays, p. 57.
B. L. lat. more than 50, p. 59.

A. *L. lat. less than* 50.

1. *African species.*

a. *More than thirteen dorsal rays.*

1. **Labeo niloticus.**

? Cyprinus rufescens, *Hasselq. Reise nach Palæst.* 1762, p. 435.
Cyprinus niloticus, *Forsk. Descr. Anim.* p. 71. no. 104; *Geoffr. Descr. Eg. Poiss.* pl. 9. fig. 2 (not good).
Labeo niloticus, *Cuv. Règne Anim.*
Chrondrostoma dembensis, *Cuv. & Val.* xvii. p. 398 (not *Rüpp.*).
Labeo vulgaris, *Heckel, in Russegger's Reisen*, ii. 3. p. 303, taf. 20. fig 3.

D. 16–19. A. 8. L. lat. 40–43. L. transv. $\frac{7-8}{6-8}$. Vert. 26/15.

Mouth rather broad. Lips thin, fringed, with an inner fold in their entire circumference, more distinct on the upper lip than on the lower. Snout obtuse, moderately projecting, with a very indistinct lobe on each side; maxillary barble minute, hidden in a lateral groove. Eye of moderate size, not much smaller than a scale, situated before or, in old examples, in the middle of the length of the head. There are four or five longitudinal series of scales between the lateral line and the ventral fin. Upper margin of the dorsal fin concave, the third and fourth rays being the longest. Body, and especially the tail, compressed, oblong, its depth being contained thrice and two-thirds or four times in the total length (without caudal). Coloration uniform.

Nile.

a, b, c, d, e, f, g. Many adult, half-grown, and young specimens. Lower Nile.

h. Fine specimen, 21 inches long. Chartoum. From Mr. Petherick's Collection.

i–l. Young. Chartoum. From Mr. Petherick's Collection.
m. Half-grown. Gondokoro. From Mr. Petherick's Collection.
n. Adult: stuffed.
o, p. Skeletons. Lower Nile.

I have but little doubt that the description given by Hasselquist of his *Cyprinus rufescens* was taken from a young example of this species, and, consequently, that it should bear the name of *Labeo rufescens*. However, the description is very incomplete and not free from errors. No locality is named; but as most of the other freshwater fishes are Nilotic species, it is almost certain that *C. rufescens* also belongs to that fauna, and not to that of Palestine, as groundlessly stated by Heckel and copied by Bleeker.

On comparing the *skeleton* (see p. 46) of *L. niloticus* with that of *L. forskalii* the following peculiarities are apparent:

1. The jawbones are remarkably small and short, especially the intermaxillary.
2. The præoperculum is of the usual shape.
3. The three ridges of the occipital crest are close together, the lateral being very low. The interneural and neural elements of the four anterior vertebræ nearly entirely confluent.
4. The interneural spines of the dorsal fin correspond to the neurals of the ninth to twenty-second vertebræ.

2. Labeo coubie.

Labeo coubie, *Rüppell, Fortsetz. d. Beschreib. neuer Nil-Fische*, p. 11, tab. 3. fig. 1 (cop. by *Cuv. & Val.* xvi. p. 344).
—— niloticus, *Cuv. & Val.* xvi. p. 338, pl. 485 (not good) (not synon.); *Heckel, in Russegger, Reisen*, ii. 3. p. 299, tab. 20. fig. 1.
—— congoro, *Peters, Monatsber. Ak. Wiss. Berlin*, 1852, p. 683.
? Labeo altivelis, *Peters, l. c.*

D. 14–16. A. 8. L. lat. 35–37. L. transv. $6\frac{1}{2}/6$.

Mouth of moderate width. Lips moderately thick, with a distinct inner fold in their entire circumference; lower lip sometimes indistinctly fringed. Snout rather produced, obtuse in front, moderately projecting beyond the lower jaw, with a distinct lobe on each side; maxillary barbel very small, hidden in a deep lateral groove. Eye rather small, as large as a scale in middle-sized specimens, though comparatively smaller in large ones; *it is situated behind the middle of the length of the head in adult examples*, and *in the middle in younger ones*. There are four or five longitudinal series of scales between the lateral line and the ventral fin. Upper margin of the dorsal fin convex, the middle rays being the longest, and certain (male?) specimens having this fin considerably elevated. Body, and especially the tail, compressed and elevated, the greatest depth of the body being contained thrice and one-third or thrice and one-fourth in the total (without caudal). Coloration uniform. Snout of certain specimens with small concave tubercles.

Nile; East Africa.

a. Sixteen inches long: stuffed. Nile.

b–i. Five to seven inches long. Chartoum. From Mr. Petherick's Collection.
k. Nine inches long. Gondokoro. From Mr. Petherick's Collection.
l. Eight inches long. Lower Nile. Purchased of Dr. Rüppell.
m–o. From fourteen to eighteen inches long: skins. River Shiré. Presented by Dr. Kirk.
p. Six inches long: skin. River Shiré. Presented by Dr. Kirk.
q. Young. River Rovuma. Presented by Dr. Kirk.

This species is much scarcer than the true *L. niloticus*, and belongs rather to the fauna of the Upper Nile than to that of the Lower. Rüppell was the first to distinguish it, whilst Valenciennes evidently confounded it with *L. niloticus*, from which it is distinguished by the more backward position of the eyes, the thicker lips, deeper and shorter body, convex and sometimes elevated dorsal fin, &c. The figure and description published by Valenciennes are evidently taken from *L. coubie*, whilst that given by Geoffroy St. Hilaire represents the true *L. niloticus*. The latter name must, of course, be retained for the common species, with which alone, probably, Forskål was acquainted.

The series of examples before me, from the Nile as well as from the Zambezi, enables me to identify Peters's *L. congoro* with that distinguished by Rüppell; and most probably also his *L. altivelis* belongs to the same species.

L. niloticus and *L. coubie* are, however, very closely allied to each other; and there is a specimen in the British Museum which unites characters of both species, having thin lips, L. lat. 42, large eye, convex dorsal fin with 15 rays, long body, and an elevated tail. It is evidently identical with four examples described as a distinct species, *Labeo horie*, by Heckel in Russegger's Reisen, ii. 3. p. 304, taf. 21. fig. 1. I am inclined to regard this as a *hybrid* between *L. niloticus* and *L. coubie*.

a. Eighteen inches long. Chartoum. From Mr. Petherick's Collection.

3. Labeo senegalensis.

Labeo senegalensis, *Cuv. & Val.* xvi. p. 346, pl. 486.
Rohitichthys senegalensis, *Bleek. Atl. Ichthyol. Cypr.* p. 25 (name only).

D. 14. A. 8. L. lat. 39. L. transv. 11.

Snout thick, obtuse, without lateral lobe; lips fringed. Eye rather small, situated before the middle of the length of the head. Body oblong. Upper margin of the dorsal fin not convex. (*Val.*)

West Africa.

? *a.* Young. Cabo negro (Angola). Presented by Dr. Welwitsch.

b. *Thirteen dorsal rays.*

4. Labeo forskalii.

Cyprinus niloticus, var. B, *Forskål, Descript. Anim.* p. 71. no. 104 *b*.
Labeo forskallii, *Rüpp. Mus. Senckenb.* ii. p. 18, tab. 3. f. 1; *Cuv. & Val.* xvi. p. 343; *Heckel, in Russegger's Reisen,* ii. 3. p. 300, taf. 20. fig. 2.
—— cylindricus, *Peters, Monatsber. Akad. Wiss. Berlin,* 1852, p. 684.

D. 13. A. 8. L. lat. 39–40. L. transv. 6/6. Vert. 23/16.

Mouth broad. Lips very thick, with a distinct inner fold in their entire circumference; lower lip generally fringed. Snout obtuse, projecting, with a broad distinct lobe on each side; maxillary barbel minute, hidden in a deep groove. Eye small, situated in the posterior half of the head (at least in mature examples), much smaller than a scale. There are four series of scales between the lateral line and the ventral fin. Upper margin of the dorsal fin concave, the third and fourth rays being the longest. Body elongate, its greatest depth being one-fourth of the total length, or even less. Sometimes an indistinct dark band along the side of the body.

Snout generally with hollow tubercles.

Nile; east coast of Africa.

a. Sixteen inches long. Chartoum. From Mr. Petherick's Collection.
b–d, e. Seven, eight, and nine inches long. Lower Nile.
f. Eleven inches long. River Rovuma. Presented by Dr. Kirk.
g. Nine inches long. River Rovuma. From Dr. Kirk's Collection.
h. Young. River Rovuma. Presented by Dr. Kirk.
i. Adult: skeleton. Chartoum. From Mr. Petherick's Collection.

On comparing the *skeleton* of *L. forskalii* with that of *L. niloticus* (see p. 48) the following peculiarities may be observed:—

1. The bones of the upper jaw are strong, the intermaxillaries being as long as, and closely attached to, the maxillaries.

2. The præoperculum is extremely broad, disciform, of greater extent than the operculum.

3. Occiput with three crests behind, of nearly equal development, and diverging from their common base. The line of separation between the interneural and neural elements of the anterior vertebræ very distinct, the neural plate being forked.

4. The interneural spines of the dorsal fin correspond to the neurals of the tenth to twentieth vertebræ.

5. Labeo brachypoma.

D. 13. A. 8. L. lat. 33. L. transv. 4/6.

Mouth broad. Lips very thick, not fringed, with a distinct inner fold in their entire circumference. Snout thick, produced, obtuse in front, much projecting beyond the lower jaw, with a broad lobe on each side; maxillary barbel minute, hidden in a deep lateral groove. Eye small, one-third the size of a scale, situated in the posterior half of the length of the head, entirely in old examples, and partly in young ones. Head thick and small, its length being one-fourth or a little less than one-fourth of the total (without caudal); the width of the interorbital space (which is rather flat) is one-half of the length of the head. Gill-cover very short. There are three longitudinal series of scales between the lateral line (which is indistinct) and the root of the ventral fin. The free portion of the scales is short and high. Dorsal fin elevated, with the upper margin convex; anal extending to the base of the caudal, which is forked, and has the lobes more or less produced. Pectoral fin reaching the base of the ventral. Body, and especially the tail, compressed and elevated; the height of the body is one-third of the total length (without caudal); free portion of the tail deeper than long, its greatest depth being three-fourths of the length of the head. Coloration uniform brownish, fins black.

Snout more or less covered with hollow tubercles.

West Africa.

a–c. Adult (12 inches long) and young. Lagos. Purchased of Mr. H. T. Ussher.

6. Labeo mesops.

D. 13. A. 7. L. lat. 39. L. transv. 6½/7.

Mouth apparently small, with moderately thick lips. Snout (without tubercles) moderately produced, the eye occupying the middle of the length of the head. Eye about as large as a scale, the diameter of *the bony orbit* being two-thirds of the length of the postorbital part of the head. The length of the head is two-ninths of the total (without caudal), the height of the body one-fourth. Interorbital space very broad and convex. Gill-cover of moderate length. There are four and a half longitudinal series of scales between the lateral line and the ventral fin. Fins rather feeble; upper margin of the dorsal concave; anal not extending to the caudal, the free portion of the tail being a little longer than deep. Pectoral fin terminating at a great distance from the ventral. Coloration uniform.

East Africa.

a. Skin, 13 inches long. Pamolombe Lake near Nyassa. Presented by Dr. Kirk.

2. *Indian species.*

a. *More than thirteen dorsal rays.*

7. Labeo nandina

Cyprinus nandina, *Ham. Buch. Fish. Gang.* p. 300, pl. 8. fig. 84; *M'Clell. Ind. Cypr.* p. 319.

Rohita nandina, *Cuv. & Val.* xvi. p. 244, pl. 473.

D. 26. A. 7. L. lat. 43–44.

Structure of snout and mouth as in the following species. Four small barbels, the upper being much smaller than the lower, which is about as long as the eye. Dorsal fin rather low. The height of the body is one-third or a little more than one-third of the total length (without caudal). Coloration uniform.

Northern Bengal. Irawaddy.

8. Labeo macronotus.

Cyprinus nandina, var., *Ham. Buch. Fish. Gang.* p. 300 (specimen with D. 23).

Cirrhinus macronotus, *M'Clell. Ind. Cypr.* p. 318, tab. 41. fig. 1 (very bad).

D. 24. A. 7. L. lat. 40. L. transv. $7\frac{1}{2}/8$.

Mouth of moderate width. Lips moderately thick, fringed, with a very distinct inner fold above and below. Snout obtuse, depressed, not swollen, slightly projecting beyond the lower jaw, without lateral lobe, with very small, scarcely conspicuous pores. Four small barbels, the upper of which are much smaller than the lower, which are two-thirds as long as the eye. Eye of moderate size, situated before the middle of the length of the head. There are five (four and a half) longitudinal series of scales between the lateral line and the ventral fin. Dorsal fin rather low. Body moderately compressed, its depth being one-third of the total length (without caudal. Coloration uniform.

Northern Bengal, Assam

a. One of the typical examples, stuffed, 20 inches long. Assam. From M'Clelland's Collection.

b. Young: stuffed. India. Purchased of Mr. Warwick.

9. Labeo chrysophekadion.

Rohita chrysophekadion, *Bleek. Verh. Bat. Gen.* xxiii. *Midd. Oost-Java*, p. 20.

—— polyporos, *Bleek. Nat. Tydschr. Ned. Ind.* v. p. 520.

—— koilogeneion, *Bleek. l. c.* xiii. p. 359.

—— cyanomelas, *Bleek. l. c.* iii. p. 597.

Morulius chrysophekadion, *Bleek. Prodr. Cypr.* p. 188; or *Atl. Ichthyol. Cypr.* p. 72, tab. 10.

D. 18–21. A. 7. L. lat. 40–41. L. transv. $8/8\frac{1}{2}$.

Mouth of moderate width. Lips moderately thick, fringed, with a very distinct inner fold above and below. Snout obtuse, depressed, slightly swollen, projecting beyond the lower jaw, without lateral lobe, with numerous conspicuous pores. Four barbels, the lower of which are considerably longer than the eye. Eye of moderate size, situated a little before the middle of the length of the head. There are five and a half longitudinal series of scales between the lateral line and the ventral fin. Upper margin of the dorsal fin concave. Body compressed, its depth being two-fifths, or rather less than two-fifths, of the total (without caudal). Coloration uniform, in preserved specimens; during life, violet, or greenish, each scale with a round golden spot.

Java and Sumatra; Siam.

a. Adult, not in good state. From Dr. Bleeker's Collection.

b. Young. Siam. From M. Mouhot's Collection.

10. Labeo fimbriatus.

Cyprinus fimbriatus, *Bloch*, xii. p. 50, pl. 409.
? Rohita fimbriata, *Cuv. & Val.* xvi. p. 271.

D. 19–20. A. 7. L. lat. 47–48. L. transv. 10/9.

Mouth broad, transverse; lips rather broad, fringed, continuous, with an inner fold, as well developed above as below. A deep transverse groove across the chin. Snout obtuse, rather thick, covered with minute pores, without lateral lobe (*Morulius*, Blkr.). Barbels four, very small, the upper half the size of the lower, which is two-thirds the length of the diameter of the eye. Head small, thick, its length being not much more than one-fifth of the total (without caudal); interorbital space convex, broad, its width being equal to the distance of the hind margin of the eye from the end of the snout. Eye of moderate size, one-fifth of the length of the head, situated nearer to the end of the snout than to that of the opercle. The height of the body is contained thrice and one-fifth in the total length (without caudal). Dorsal fin not elevated, with the upper margin slightly concave, the length of its longest ray being equal to that of the head; its origin is opposite to the fourteenth scale of the lateral line. Anal fin very narrow, extending to the root of the caudal, which is deeply forked, the length of its middle rays being one-third of that of the outer longest. Pectoral and ventral fins of equal length, the former extending to the fourteenth scale of the lateral line. There are seven longitudinal series of scales between the lateral line and the ventral fin. Coloration uniform, fins blackish.

Madras.

a, b. Thirteen inches long. Presented by Capt. Mitchell.

Prof. Peters has, at my request, examined the typical specimen; it agrees with our example in all essential characters.

11. Labeo leschenaulti.

Rohita leschenaulti, *Cuv. & Val.* xvi. p. 261.

D. 18–19. A. 7. L. lat. 43–44. L. transv. 9/8.

Mouth of moderate width. Lips moderately thick, fringed, with a very distinct inner fold above and below. Snout obtuse, depressed, not much swollen, moderately projecting beyond the lower jaw, without lateral lobe, with very small, scarcely conspicuous pores. Four small barbels, the upper of which are half the size of the lower, which are two-thirds as long as the eye. Eye of moderate size, situated before the middle of the length of the head. There are five and a half longitudinal series of scales between the lateral line and the ventral fin. Upper margin of the dorsal fin slightly concave. Body moderately compressed, its depth being nearly one-third of the total length (without caudal). Coloration uniform, fins blackish.

East-Indian continent.

a. Adult. Kotamurdoor Tank, South Arcot. Presented by Capt. Mitchell.

b. Young. Orissa, Central Asia. From the Collection of Messrs. von Schlagintweit.

12. **Labeo calbasu.**

Cyprinus calbasu, *Ham. Buch. Fish. Gang.* pp. 297, 387, tab. 2. fig. 33 (not good).
Cirrhinus calbasu, *M'Clell. Ind. Cypr.* pp. 265, 320.
Cirrhina micropogon, *Valenc. in Bélanger, Voy. Ind. orient.* p. 372, tab. 3. fig. 1.
Rohita calbosu, *Cuv. & Val.* xvi. p. 252; *Bleek. Verh. Bat. Gen.* xxv. *Beng. & Hindost.* p. 131.
—— belangeri, *Cuv. & Val.* xvi. p. 255; *Bleek. l. c.* p. 132.
Labeo velatus, *Valenc. in Cuv. Règne An. Ill. Poiss.* pl. 93. fig. 3.

D. 16–18. A. 7. L. lat. 42–43. L. transv. 8/10.

Mouth of moderate width. Lips moderately thick, fringed with a very distinct inner fold above and below. Snout obtuse, depressed, not swollen, moderately projecting beyond the lower jaw, without lateral lobe, with very small, scarcely conspicuous pores. Four barbels, considerably longer than the eye. Eye of moderate size, or, in adult specimens, small, situated before the middle of the length of the head. There are six longitudinal series of scales between the lateral line and the ventral fin. Upper margin of the dorsal fin slightly concave. Body moderately compressed, its depth being two-sevenths or one-third of the total length (without caudal). Coloration uniform. fins blackish.

Bengal.

a. Adult: stuffed (15 inches). India. From the Collection of the East-India Company.
b. Adult: stuffed. Loodianah (?). From the Collection of the East-India Company.
c–d. Half-grown. Calcutta. From the Collection of Messrs. von Schlagintweit.
e. Half-grown. Ganges. Presented by G. R. Waterhouse, Esq.
f. Young. River Hooghly. Described by Dr. Bleeker as *R. calbosu.*
g. Young. River Hooghly. Described by Dr. Bleeker as *R. belangerii.*

13. **Labeo porcellus.**

Tylognathus porcellus, *Heckel, in Hügel's Kaschmir*, iv. p. 385.

D. 18. A. 8. L. lat. 39. L. transv. $7/5+x$.

Mouth broad, lips thick, continuous, with an inner fold in their entire circumference. Snout obtuse, projecting beyond the lower jaw. Four small barbels. Eye of moderate size, occupying the middle of the length of the head. There are five longitudinal series of scales between the lateral line and the ventral fin. Caudal fin forked. Coloration uniform. (*Heck.*)

Bombay.

a. Adult: stuffed, not in good state. From the Collection of the East-India Company.

14. Labeo rohita.

Cyprinus rohita, *Ham. Buch. Fish. Gang.* p. 301, pl. 36. fig. 85.
Cirrhinus rohita, *M'Clell. Ind. Fish.* pp. 266, 321, tab. 41. fig. 2 (bad).
Rohita buchanani, *Cuv. & Val.* xvi. p. 251; *Bleek. Verh. Bat. Gen.* xxv. 1853, *Hind. & Beng.* p. 133.

D. 15–16. A. 7. L. lat. 40–41. L. transv. 6/9.

Mouth of moderate width. Lips moderately thick, fringed, with a very distinct inner fold above and below. Snout obtuse, depressed, not swollen, moderately projecting beyond the lower jaw, without lateral lobe. Four minute barbels, the upper of which are sometimes absent. Eye of moderate size, situated before the middle of the length of the head. There are six longitudinal series of scales between the lateral line and the ventral fin. Upper margin of the dorsal fin slightly concave. Body moderately compressed, its depth being two-sevenths of the total length (without caudal). Coloration uniform; young specimens sometimes with a more or less distinct blackish spot on the middle of the end of the tail.

Fresh waters of the East-Indian continent.

a. Thirty-four inches long: stuffed. India. From the Collection of the Zoological Society.
b. Adult: stuffed. Loodianah. From the Collection of the East-India Company.
c. Half-grown: skin. Loodianah. From the Collection of the East-India Company.
d. Half-grown: stuffed. River Gogra. Purchased of Mr. Warwick.
e–g. Half-grown: stuffed. River Rapti, near Gorackpoor. Purchased of Mr. Warwick.
h. Half-grown. Calcutta. Presented by Thomas Moore, Esq.
i. Young. River Hooghly. From Dr. Bleeker's Collection.
k–m. Young. Bengal. Presented by G. R. Waterhouse, Esq.

Rohita duvaucelii, Cuv. & Val. xvi. p. 262, is perhaps identical with *L. rohita*.

15. Labeo rouxii.

Bohita rouxii, *Cuv. & Val.* xvi. p. 270.

D. 15. A. 7. L. lat. 46.

Barbels four, extremely minute. Coloration uniform, dark lines along the series of scales. (*Val.*).

Bombay.

16. Labeo kontius.

Cyprinus kontius, *Jerdon, Madr. Journ. Lit. & Sc.* xv. 1849, p. 302.
Labeo kontius, *Day, Proc. Zool. Soc.* 1867, p. 289.

D. 15. A. 7. V. 10. L. lat. 38. L. transv. 9/5+*x*.

The length of the head is one-seventh, the height of the body one-fourth of the total length (with the caudal). Eye in the hinder half of the head. Snout with tubercles and a lateral fleshy prolongation.

Opercle high and narrow. Barbels none (?). Upper margin of dorsal fin concave. Coloration uniform. Pharyngeal teeth 5 . 4 . 2—2 . 4 . 5.
Bowany River.

These notes were taken from a stuffed example, 21½ inches long.

17. Labeo morala.

Cyprinus morala, *Ham. Buch. Fish. Gang.* p. 331, pl. 18. fig. 91; *Gray, Ind. Zool.*; *M'Clell. Ind. Cypr.* p. 326.
—— pausius, *Ham. Buch. l. c.* p. 332.
? Cyprinus musiha, *Ham. Buch. l. c.* pp. 333, 392.

D. 13–14. A. 8.

Scales of moderate size. Snout projecting, not very thick, with very small pores, without lateral lobe. Four barbels, about as long as the eye. A blackish spot at the end of the tail. (*H. B.*)
Bengal.

18. Labeo erythropterus.

Diplocheilus erythropterus, *V. Hass. Algem. Konst- en Letterbode*, 1823, ii. p. 133.
Labeo erythropterus, *Cuv. & Val.* xvi. p. 354; *Bleek. Nat. Tydschr. Ned. Ind.* xiii. p. 360.
Lobocheilus lucas, *Bleek. l. c.* p. 362 (young).
Labeo (Diplocheilus) erythropterus, *Bleek. Prodr. Cypr.* p. 135; or *Atl. Ichthyol. Cypr.* p. 52, tab. 5.
—— (——) lucas, *Bleek. l. c.* p. 53, tab. 8. fig. 4.

D. 14. A. 7. L. lat. 42. L. transv. 8/7.

Mouth broad. Lips thick, continuous, not fringed, with an inner fold in their entire circumference, equally developed on the lower and upper lips. Snout obtuse, much projecting beyond the lower jaw, with a very distinct lateral lobe. Four small barbels, the upper of which are sometimes lost with age. A deep groove on each side of the snout. Eye small, not so large as a scale, situated in or (in adult examples) behind the middle of the length of the head. There are five longitudinal series of scales between the lateral line and the ventral fin. Upper margin of the dorsal fin concave, the anterior rays being somewhat produced; caudal fin deeply forked, the length of the middle rays being two-sevenths of that of the outer longest, which are considerably longer than the head. The height of the body is contained thrice and one-sixth in the total length (without caudal), the length of the head four times and one-third. Coloration uniform.
Java.

a. Adult. From Dr. Bleeker's Collection.
b. Young. From Dr. Bleeker's Collection (*Labeo lucas*).

As in other species of *Labeo*, the operculum is comparatively shorter in old examples than in young ones.

b. *Thirteen dorsal rays.*

19. Labeo diplostomus.

Varicorhinus diplostomus, *Heckel, Fische aus Caschmir*, p. 67, tab. 11.
Labeo diplostomus, *Cuv. & Val.* xvi. p. 360.
Tylognathus valenciennesii, *Heckel, in Hügel's Reise*, iv. p. 378, and *in Russegger's Reisen*, ii. 3. p. 283 (name only).

D. 13. A. 8. L. lat. 41. L. transv. $8\frac{1}{2}/11$.

Mouth broad. Lips thick, continuous, with an inner fold in their entire circumference, more developed on the lower lip than on the upper; lower lip fringed. Snout obtuse, much projecting beyond the lower jaw, with a very indistinct lateral lobe. Two barbels only, very small, hidden in a lateral groove. Eye small, nearly as large as a scale, situated before the middle of the length of the head. There are seven longitudinal series of scales between the lateral line and the ventral fin. Upper margin of the dorsal fin slightly convex (?), the anterior rays being not longer than the head; *caudal fin slightly forked, the length of the middle rays being one-half of that of the outer longest*, which are scarcely longer than the head. Body rather elongate; head small, broad. Coloration uniform. (*Heck.*)

Cashmere.

20. Labeo ricnorhynchus.

The Nepura (Assam).
Gobio ricnorhynchus, *M'Clell. Ind. Cypr.* pp. 279, 363, pl. 55. fig. 1.

D. 13. A. 8. L. lat. 43–44. L. transv. 8–9/9.

Mouth broad; lips thick, continuous, with an inner fold in their entire circumference, more developed on the lower lip than on the upper; lower lip fringed. Snout obtuse, of moderate length, much projecting beyond the lower jaw, with a very indistinct lateral lobe. Two barbels only, very small, hidden in a lateral groove. Eye small, nearly as large as a scale, *situated in or a little behind the middle of the length of the head*. There are six longitudinal series of scales between the lateral line and the ventral fin. Upper margin of the dorsal fin concave, the anterior rays being produced; *caudal fin deeply forked, the length of the middle rays being two-sevenths of that of the outer longest*, which are considerably longer than the head. Body rather elongate, head small, broad. Coloration uniform

Snout and forehead with tubercles.

Rivers of the Himalayan region.

a–c. Adult: stuffed and skins. Peschowar. From M'Clelland's Collection.
d. Sixteen inches long. Nepal. Presented by B. H. Hodgson, Esq.
e. Fine half-grown specimen. Sargu River at Bagesert (Himalayas). From the Collection of Messrs. v. Schlagentweit.
Half-grown. Jamu (Himalayas). From the Collection of Messrs v. Schlagintweit.

21. Labeo falcatus.

Cyprinus (Bangana) falcata, *Gray, Ind. Zool.* (scales too small).
Gobio malacostomus, *M'Clell. Ind. Cypr.* p. 280.

D. 13. A. 8. L. lat. 43. L. transv. $7\frac{1}{2}/8$.

Mouth broad; lips thick, continuous, with an inner fold in their entire circumference, more developed on the lower lip than on the upper. Snout obtuse, long, much projecting beyond the lower jaw, with a distinct lateral lobe. Two barbels only, very small, hidden in a lateral groove. Eye small, considerably smaller than a scale, *situated far behind the middle of the length of the head.* There are four and a half or five longitudinal series of scales between the lateral line and the ventral fin. Upper margin of the dorsal fin concave, the anterior rays being produced; caudal fin deeply forked, the length of the middle rays being one-third of that of the outer longest, which are not much longer than the head. Body rather elongate; head small, broad, depressed. Coloration uniform.

Peninsula of India.

a. Adult: stuffed. "Terrya Ghat." From the Collection of the East-India Company.
b. Adult: stuffed. Presented by T. C. Jerdon, Esq.

22. Labeo pangusia.

Cyprinus pangusia, *Ham. Buch.* p. 285.
Gobio pangusia, *M'Clell. Ind. Cypr.* pp. 279, 362, tab. 42. fig. 1 (copied from Hamilton's MS. drawing).

D. 13. A. 7. L. lat. 39. L. transv. $7\frac{1}{2}/7$.

Mouth rather narrow. Lips moderately thick, not fringed, with a distinct inner fold in their entire circumference. Snout rather produced, obtuse in front, projecting beyond the lower jaw, with a distinct lobe on each side; maxillary barbel small, hidden in a deep lateral groove. Eye of moderate size, situated behind the middle of the length of the head. There are four and a half longitudinal series of scales between the lateral line and the ventral fin. Upper margin of the dorsal fin concave, the anterior rays being the longest; the length of the middle caudal rays two-fifths of that of the outer ones. Body and tail compressed and elongate, the greatest depth of the body being one-fourth of the total length (without caudal). Snout with numerous pores in front.

River Kosi, Cachar.

a–b. Stuffed, 7 inches long. River Song (?). From Griffith's Collection.
c–d. Half-grown. Cachar. Presented by Lieut.-Col. Playfair.

23. Labeo pleurotænia.

Lobocheilos pleurotænia, *Bleek. Nat. Tydschr. Ned. Ind.* ix. p. 267.
Diplocheilichthys pleurotænia, *Bleek. Prodr. Cypr.* p. 143; or *Atl. Ichthyol. Cypr.* p. 55, tab. 9. fig. 1.

Lobocheilos rohitoides, *Bleek. Nat. Tydschr. Ned. Ind.* xiii. p. 363 (young).
Labeo (Diplocheilus) rohitoides, *Bleek. Prodr. Cypr.* p. 139; or *Atl. Ichthyol. Cypr.* p. 53, tab. 8. fig. 3.

D. 13. A. 7. L. lat. 34. L. transv. 5/5½.

Mouth broad. Lips thick, continuous, not fringed, with an inner fold in their entire circumference, more developed below than above. Snout rather obtuse, much projecting beyond the lower jaw, without lateral lobe. Four barbels, nearly as long as the eye. A deep groove on each side of the snout. Eye rather small, situated in or (in adult examples) behind the middle of the length of the head. There are three longitudinal series of scales between the lateral line and the ventral fin. Upper margin of the dorsal fin concave, the anterior rays being somewhat produced; caudal fin deeply forked, the length of the middle rays being two-sevenths of that of the outer longest, which are considerably longer than the head. The height of the body is contained thrice and three-fourths in the total length (without caudal); the length of the head four times and one-fifth. A blackish band along the middle of the side of the body.

Sumatra; Java.

a. Type of the species. Sumatra. From Dr. Bleeker's Collection.
b. Type of *L. rohitoides*. Batavia, Krawang. From Dr. Bleeker's Collection.

B. *L. lat. more than* 50.

24. Labeo dussumieri.

Rohita dussumieri, *Cuv. & Val.* xvi. p. 258, pl. 475; *Day, Fish. of Malabar*, p. 207.

D. 16. A. 7. L. lat. 53–55. L. transv. 8/9.

Mouth of moderate width. Lips moderately thick, fringed, with a very distinct inner fold above and below. Snout rather obtuse, depressed, scarcely swollen, with numerous pores in front, without lateral lobe. Four minute barbels, the upper of which are sometimes absent. Eye of moderate size, situated somewhat before the middle of the length of the head. There are five longitudinal series of scales between the lateral line and the ventral fin. Upper margin of the dorsal fin slightly concave. Body moderately compressed, its depth being one-fourth of the total length (without caudal). Coloration uniform; a silvery streak along each series of scales. Young examples with a large blackish spot on the end of the tail.

Peninsula of India; Ceylon.

a. Half-grown: skin. Cochin.
b. Adult: skin. Ceylon. From Kelaart's Collection.
c–e. Young. Ceylon. Purchased of Mr. Cuming.

Cyprinus gonius, Ham. Buch. Fish. Gang. pp. 292 & 387, pl. 4. fig. 82, appears to be very closely allied to the above species.—Bengal.

25. Labeo chalybeatus.

Rohita chalybeata, *Cuv. & Val.* xvi. p. 271.

D. 19. A. 7. L. lat. 65.

Lips fringed; barbels four. The length of the head is one-fifth of the total (with the caudal), the diameter of the eye one-third of the length of the head. Caudal lobes elongate. Coloration uniform. (*Val.*)

Rangoon. (Specimen 5 inches long.)

Rohita lineata, Cuv. & Val. xvi. p. 260, from the Irawaddy, cannot be distinguished from this species according to the descriptions given by Valenciennes. He evidently never compared the two fishes which, however, appear to be identical.

26. Labeo microlepidotus.

Cuv. & Val. xvi. p. 352.

D. 17. A. 7. L. lat. 63.

Lips fringed; two extremely small barbels. The height of the body is one-fourth of the total length (with the caudal), the length of the head one-fifth; the diameter of the eye one-third of the length of the head. Coloration uniform. (*Val.*)

Rangoon.

27. Labeo cursa.

Cyprinus cursa, *Ham. Buch. Fish. Gang.* p. 290.
—— cursis, *Ham. Buch. Fish. Gang.* p. 292.
? Cyprinus curchius, *Ham. Buch. Fish. Gang.* p. 289.
Labeo curchius, cursis et cursa, *M'Clell. Ind. Cypr.* pp. 268, 327, 329, tab. 40. fig. 3, t. 38. figs. 2 & 3.
Rohita tincoides, *Cuv. & Val.* xvi. p. 269.
—— chalybeata, *Bleek. Verh. Bat. Gen.* xxv. *Beng. & Hindost.* p. 133 (not *C. & V.*).
—— microlepidota, *Günth. Proc. Zool. Soc.* 1861, p. 225.

D. 16–17. A. 7. L. lat. 80. L. transv. 15/16.

Mouth rather narrow. Lips moderately thick, with a very distinct inner fold above and below; the lower finely fringed. Snout rather obtuse, slightly swollen, with numerous small hollow tubercles in front, depressed, without lateral lobe. Four minute barbels, the upper of which are sometimes absent. Eye of moderate size, or rather small, in adult examples; situated somewhat before the middle of the length of the head. There are eleven or twelve longitudinal series of scales between the lateral line and the ventral fin. Upper margin of the dorsal fin slightly concave. Body moderately compressed, its depth being contained thrice and three-fifths in the total length (without caudal). Coloration uniform.

Bengal; Nepal.

a. Adult: stuffed. Nepal. Presented by B. H. Hodgson, Esq. Type of *R. microlepidota*.

b. Half-grown, fine specimen. Ganges. From the Collection of the Zoological Society.

c. Young, in bad state. River Hooghly. From Dr. Bleeker's Collection.
d. Adult: stuffed. Calcutta. From the Collection of the East-India Company.
e–h. Adult (10–13 inches long): stuffed. India.

12. BARYNOTUS.

Scales of small, moderate, or large size; lateral line running along the middle of the side of the tail. Dorsal fin with the third simple ray more or less ossified, and with more than nine branched rays, commencing somewhat in advance of the ventrals. Anal fin very short. Mouth arched, without inner folds or horny covering. Barbels short, four or two. Pseudobranchiæ present: gill-rakers short. Pharyngeal teeth 5 . 3 . 2—2 . 3 . 5, subconical.

West Africa; East Indies.

1. Barynotus lagensis.

D. 13. A. 7–8. L. lat. 24–25. L. transv. 4½–3½.

The height of the body is contained twice and a half in the total length (without caudal), the length of the head four times and two-thirds. Eye of moderate size, shorter than the snout, and nearly one-fourth of the length of the head. Snout obtuse; mouth inferior, semicircular; four barbels, the lower being somewhat longer than the upper, and as long as the orbit; lower jaw with a sharpish margin, without lip. The third dorsal ray is not much stronger than the others, non-serrated, and much longer than the base of the fin or than the head. Origin of the dorsal somewhat nearer to the end of the snout than to the root of the caudal. Anal fin narrow, high, extending beyond the root of the caudal, if laid backwards. Caudal fin forked, with the upper lobe a little exceeding the lower in length. The free portion of the tail is as high as long. Pectoral fin longer than the head, and than the ventral, but not reaching the root of the latter. Lateral line indistinct; there are two series of scales between the lateral line and ventral fin. Coloration uniform bronze; fins black.

West Africa.

a. Twelve inches long. Lagos. Purchased of Mr. H. T. Ussher.

2. Barynotus microlepis.

Capoëta microlepis, *Bleek. Nat. Tydschr. Ned. Ind.* ii. p. 206.
Cyclocheilichthys (Siaja) microlepis, *Bleek. Prodr. Cypr.* p. 371; or *Atl. Ichthyol. Cypr.* p. 85, pl. 27. fig. 3.

D. 18–20. A. 7–8. L. lat. 56. L. transv. 10/9.

Dorsal spine long, slender, finely serrated. A short barbel at the angle of the mouth. There are five and a half longitudinal series of scales between the lateral line and ventral fin. The height of the body is contained thrice and two-thirds in the total length (without caudal), the length of the head four times. Eye large, nearly as long as the snout, and two-sevenths of the length of the head. Mouth inferior, small, horseshoe-shaped, lower jaw with the lip continuous round its margin. Ventral fins long, longer than pectoral. Coloration uniform.

Borneo and Sumatra.

a. Typical specimen. From Dr. Bleeker's Collection.

Although this species differs in a number of well-marked characters from the other, I hesitate to separate them generically, as we have seen a continuous chain of species distinguished by the very same characters in the genus *Barbus*.

13. TYLOGNATHUS*.

Lobocheilus, *Van Hass.* 1823 (without characters).
Labeo, sp., *Cuv. & Val.*
Tylognathus, sp., et Labeo, sp., *Heckel.*
Schismatorhynchus, Lobocheilus, sp., Gobionichthys, et Tylognathus, sp., *Bleeker.*

Scales of moderate size. Dorsal fin without osseous ray, with not more than nine branched rays, commencing somewhat in advance of the ventrals. Snout obtusely rounded, the skin of the maxillary region being thickened, swollen, forming a projection beyond the mouth. Mouth essentially formed as stated in *Labeo*. Barbels very small, two or four, the maxillary barbels hidden in a deep groove behind the angle of the mouth. Anal scales not enlarged. Anal fin very short. Pharyngeal teeth 5 . 4 . 2—2 . 4 . 5, uncinate.

Snout frequently with tubercles or pores.

East Indies; Syria.

It cannot be denied that the separation of this genus from *Labeo* is artificial; but by uniting these two genera, I should have been obliged to abandon the character of a long or short dorsal fin for the definition of other very natural genera of Cyprinoids. Also the skeleton of *Tylognathus* is distinguished by the same characters as indicated for *Labeo* (p. 46).

1. Tylognathus striolatus.

D. 12. A. 7. L. lat. 58. L. transv. 12/14.

A rudimentary barbel at each corner of the mouth. Snout thick, somewhat projecting beyond the lower jaw, without lateral lobe; it is short, its length being considerably less than the width of the interorbital space, which is convex. Eye small, one-fifth or one-sixth of the length of the head, and more than one-half of that of the snout. There are nine longitudinal series of scales between the lateral line and ventral fin. The length of the head is contained four times and three-fourths in the total (without caudal), the height of the body thrice and two-thirds. Fins short. The origin of the dorsal fin is in advance of that of the ventral, and nearer to the end of the snout than to the root of the caudal. Blackish-green above, shining silvery on the sides and abdomen. The reflection of light produces a darker line along each series of scales above the lateral line.

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* 1. Cyprinus dero, *Ham. Buch.* p. 277, pl. 22. fig. 78.—Brahmaputra.—Two (?) barbels, well developed, at the angle of the mouth.
2. Gobio canarensis, *Jerdon, Madr. Journ. Lit. & Sc.* xv. 1849, p. 306.—Canara.
3. Cirrhinus burnesiana, *M'Clell. Calc. Journ. Nat. Hist.* ii. 1842, p. 582, is characterized (!) thus:—"Head short, thick, round; postoperculum (!) narrow and small, lower jaw short, mouth inferior. D. 9. A. 7. Cabul River at Jullalabad."
4. —— fasciatus, *Jerdon, l. c.* p. 305.—Malabar.

Poona.

a–b. Seven inches long. Presented by Lieut.-Col. Playfair.

This fish is very similar to one represented by Buchanan in his manuscript drawings under the name of *Cyprinus bangon*, and erroneously referred by M'Clelland to his *Gobius limnophilus*, Ind. Cypr. p. 358, which is a fish with much larger scales. M'Clelland gives a copy of this drawing, tab. 58. fig. 2. However, Buchanan has also added an upper view of the head (omitted by M'Clelland), in which two *rostral* barbels are very distinct.

2. Tylognathus ariza.

Cyprinus ariza, *Buchanan, Journey through Mysore*, iii. p. 344, pl. 31; *Fish. Gang.* pp. 286, 386.
Gobio hamiltonii, *Jerdon, Madr. Journ. Lit. & Sc.* xv. 1849, p. 307.
—— bovanius, *Jerdon, l. c.*

Closely allied to *T. boga*.

D. 12. A. 7. L. lat. 37. L. transv. $7\frac{1}{2}/7\frac{1}{2}$.

Two small barbels. Snout rather thick, projecting beyond the lower jaw, *without lateral lobe*. Eye of moderate size, somewhat before the middle of the length of the head. There are five longitudinal series of scales between the lateral line and the root of the ventral fin. Body oblong, its depth being more than the length of the head, and one-fourth of the total (without caudal). The origin of the dorsal fin is considerably in advance of that of the ventral, and nearer to the end of the snout than to the root of the caudal. Caudal fin deeply forked. Coloration uniform.

Peninsula of India.

a. Seven and a half inches long. Madras. Presented by Capt. Mitchell.

Buchanan distinguishes this species from *T. boga* by the absence of pores on the snout. Our specimen has very distinct pores; and it is probable that this peculiarity of the skin is equally developed in both species at certain seasons of the year.

Gobio isurus, M'Clell. Ind. Cypr. pp. 277, 357, from Assam, is said to be very similar to *T. ariza*; indeed no characters by which the two fishes might be distinguished have been pointed out.

3. **Tylognathus boga.**

Cyprinus boga, *Ham. Buch. Fish. Gang.* pp. 286, 386, pl. 28. fig. 80.
Gobio boga, *M'Clell. Ind. Cypr.* pp. 278, 361; *Bleek. Verh. Bat. Gen.* xxvi. *Hind. & Beng.* p. 134.

D. 12. A. 7. L. lat. 42. L. transv. $7\frac{1}{2}$-$6\frac{1}{2}$/7.

Mouth crescent-shaped, transverse, not very broad. Upper and lower jaws with well-developed lips, which are continuous; each jaw with a sharp inner fold. Two small barbels hidden in a deep lateral groove. Snout rather thick, projecting beyond the lower jaw, *with a small lobe on each side.* Eye of moderate size, somewhat behind the middle of the length of the head. There are five longitudinal series of scales between the lateral line and the root of the ventral fin. Body oblong, its depth being more than the length of the head. The origin of the dorsal fin is considerably in advance of that of the ventral, and nearer to the end of the snout than to the root of the caudal. Caudal fin deeply forked. Coloration uniform.

Bengal.

a. Young. River Hooghly. From Dr. Bleeker's Collection.
b. Fine specimen. Cossye River. Presented by Lieut. R. C. Beavan, Esq.

4. **Tylognathus elegans.**

D. 11. A. 7. L. lat. 36. L. transv. $\frac{4\frac{1}{2}}{6}$.

Mouth transverse, with the lips well developed; lower jaw sharp. Four small barbels. Snout (without tubercles) projecting beyond the lower jaw. Eye two-sevenths or one-fourth of, and situated before the middle of, the length of the head. There are three longitudinal series of scales between the lateral line and ventral fin. The height of the body equals the length of the head, and is contained four times and two-thirds in the total (without caudal). Origin of the dorsal fin considerably in advance of that of the ventral, and nearly midway between the extremity of the snout and the end of the anal. Pectoral fin shorter than the head, terminating at a great distance from the ventral. Caudal fin forked. Coloration uniform, an indistinct silvery lateral band.

Mesopotamia?

a. Numerous examples, two inches long. Euphrates expedition.

5. **Tylognathus nanus.**

Tylognathus nanus, *Heckel, in Russegger's Reisen*, i. p. 1073 (without figure).

D. 11. A. 7. L. lat. 31. L. transv. $6/4+x$.

Mouth transverse; upper and lower jaws sharp, with well-developed lips. Four small barbels. Snout thick (tubercular), projecting beyond the lower jaw. Eye situated in the anterior half of the head. There are four longitudinal series of scales between the lateral line and the root of the ventral fin. Body subcylindrical, its depth being equal to the length of the head, which is one-fifth of the total length (with the caudal). Origin of the dorsal fin opposite to that of the ventrals. Caudal fin emarginate. (*Heck.*)

Damascus.

6. Tylognathus falcifer.

Labeo falcifer, *Cuv. & Val.* xvi. p. 358.

Lobocheilus falcifer (*Van Hasselt, Alg. Konst- en Letterbote,* 1823, ii. p. 133); *Bleek. Nat. Tydschr. Ned. Ind.* v. p. 522; or *Prodr. Cypr.* p. 148; or *Atl. Ichthyol. Cypr.* p. 56, tab. 6.

Tylognathus falcifer, *Heckel, in Russegger's Reisen,* ii. 3. p. 283 (name only).

D. 11. A. 8. L. lat. 33–35. L. transv. $5\frac{1}{2}/5$ Vert. 19/13.

Mouth transverse, broad; both jaws with thick lips, which are separated from each other by a deep incision, the lower lip forming a kind of moveable lobe, free in front; inner fold of the upper lip very indistinct; lower jaw with a very sharp margin. Snout obtusely pointed, projecting beyond the lower jaw, porous. Barbels four, very small. Eye very small, situated somewhat behind the middle of the length of the head. There are *three* longitudinal series of scales between the lateral line and the root of the ventral fin. The height of the body is contained thrice and one-third in the total length (without caudal), the length of the head from four times and two-thirds to five times and one-fifth. Origin of the dorsal fin in advance of that of the ventral, opposite to the eleventh scale of the lateral line. Anterior dorsal rays more or less prolonged in adult examples. Caudal fin deeply forked. Coloration uniform.

Java and Sumatra.

a. Adult. From Dr. Bleeker's Collection.

b. Adult: skeleton. Purchased.

Skeleton.—On comparing the skeleton with that of *L. niloticus* (p. 48) and *L. forskalii* (p. 50), the following peculiarities may be observed:—

1. The bones of the upper jaw are much dilated, the intermaxillaries being shorter and narrower than the maxillaries. The transverse anterior portion of the mandible is much dilated, provided with a pentagonal concave surface below, broader than long.

2. Præoperculum of the usual shape.

3. The lateral ridges of the occipital crest are low and somewhat distant from the median principal ridge.

4. The interneural spines of the dorsal fin correspond to the neurals of the ninth to seventeenth vertebræ.

5. First rib dilated in its upper third, the dilatation being directed forwards.

Gobio microcephalus, Bleek. Nat. Tydschr. Ned. Ind. xiii. p. 357; or *Lobochilus* (*Gobionichthys*) *microcephalus*, Bleek. Prodr. Cypr. p. 156; or Atl. Ichthyol. Cypr. p. 60, tab. 8. fig. 2, is founded on a single example, 71$^{\text{mm}}$ long, which appears to be a young *T. falcifer*.

a. Type of *Gobio microcephalus*, in bad state. Java. From Dr. Bleeker's Collection.

7. Tylognathus schwanefeldi.

Lobocheilus schwanefeldi, *Bleeker, Nat. Tydschr. Ned. Ind.* v. p. 523; or *Prodr. Cypr.* p. 150; or *Atl. Ichthyol. Cypr.* p. 57, tab. 9. fig. 3.

D. 11. A. 8. L. lat. 34. L. transv. 5½/5.

Structure of mouth and snout as in *T. falcifer*, to which this species is extremely similar. Barbels four, very small. Eye small, situated somewhat behind the middle of the length of the head. There are *three* longitudinal series of scales between the lateral line and the root of the ventral fin. *The height of the body equals the length of the head, which is two-ninths or one-fifth of the total (without caudal).* Origin of the dorsal fin in advance of that of the ventral, opposite to the tenth scale of the lateral line. Anterior dorsal rays more or less prolonged in adult examples. Caudal fin deeply forked. A narrow, yellowish, longitudinal band runs along the side of the body, above the lateral line.

Java and Sumatra.

a. One of the typical specimens. From Dr. Bleeker's Collection.

8. Tylognathus lehat.

Lobocheilus lehat, *Bleek. Prodr. Cypr.* p. 152; or *Atl. Ichthyol. Cypr.* p. 58, tab. 8. fig. 8.

D. 11. A. 8. L. lat. 32–33. L. transv. 4½/4.

Structure of mouth and snout as in *T. falcifer*, from which it differs in having larger scales. Barbels four, very small. Eye small, situated somewhat behind the middle of the length of the head. There are two and a half longitudinal series of scales between the lateral line and the root of the ventral fin. The height of the body is contained four times or thrice and three-fourths in the total length (without caudal), the length of the head four times and a half or five times. Origin of the dorsal fin in advance of that of the ventral, opposite to the ninth scale of the lateral line. Anterior dorsal rays scarcely prolonged in adult examples. Caudal fin forked. Coloration uniform.

Java.

a. Young, one of the typical specimens. From Dr. Bleeker's Collection.

b–e. Fine adult (nine inches) and half-grown specimens. Purchased of Mr. Frank.

9. Tylognathus hispidus.

Labeo hispidus, *Cuv. & Val.* xvi. p. 356.
Chondrostroma lipocheilus, *Cuv. & Val.* xvii. p. 400, pl. 513.
Tylognathus lipocheilus, *Heckel, in Russegger's Reisen*, ii. 3. p. 283.
Gobio javanicus, *Bleek. Nat. Tydschr. Ned. Ind.* xiii. p. 358.
Lobocheilus (Gobionichthys) hispidus, *Bleek. Prodr. Cypr.* p. 158; or *Atl. Ichthyol. Cypr.* p. 59, tab. 7. fig. 2.

D. 11. A. 8. L. lat. 35. L. transv. 5½/5½.

Structure of mouth and snout as in *T. falcifer*, but having two very small barbels only. Eye of moderate size, situated somewhat behind the middle of the length of the head. There are *three* longitudinal series of scales between the lateral line and the root of the ventral fin. The height of the body is contained thrice and three-fourths in the total length (without caudal), the length of the head five times. Origin of the dorsal fin in advance of that of the ventral, opposite to the tenth scale of the lateral line. Anterior dorsal rays more or less prolonged in adult examples. Caudal fin deeply forked. Coloration uniform.

Java.

a. Adult. From Dr. Bleeker's Collection.

10. **Tylognathus heterorhynchus.**

Lobocheilus heterorhynchos, *Bleek. Nat. Tydschr. Ned. Ind.* v. p. 524.
Schismatorhynchus heterorhynchus, *Bleek. l. c.* ix. p. 269; or *Prodr. Cypr.* p. 131; or *Atl. Ichthyol. Cypr.* p. 50, tab. 4. fig. 4.
—— lobocheiloides, *Bleek. Nat. Tydschr. Ned. Ind.* xiv. p. 476.

D. 11. A. 7. L. lat. 33. L. transv. $5\frac{1}{2}/6$.

Mouth transverse, broad; upper and lower jaws with well-developed lips, which are separated from each other by a deep incision behind each angle of the mouth, a piece of skin lying in the same incision and forming a kind of communication between the two lips. The lower jaw with sharpish margin. Maxillary part of the snout with a thick, triangular enlargement of the skin, separated behind from the forehead by a deep transverse groove. Snout much projecting, the lower jaw without lateral lobes, slightly porous above. Barbels four, longer than the eye. Eye very small, situated a little behind the middle of the length of the head. There are three longitudinal series of scales between the lateral line and the root of the ventral fin. The height of the body is contained thrice and three-fourths in the total length (without caudal), the length of the head four times and two-thirds. Origin of the dorsal fin in advance of that of the ventral, opposite to the ninth scale of the lateral line. Anterior dorsal rays more or less produced in adult examples. Caudal fin deeply forked. A blackish band runs along the middle of the side.

Sumatra and Java.

a. Typical specimen. From Dr. Bleeker's Collection.

14. ABROSTOMUS.

Abrostomus, *Smith, Zool. S. Afr. Pisces.*

Scales small. Dorsal fin without osseous ray, with not more than nine branched rays, commencing nearly opposite to the ventrals. Snout obtusely rounded, rather thickened, and projecting beyond the mouth; mouth inferior, transverse, with pulpy lips, which are continuous and not fringed, the lower one with a membranous fold internally like a second lip; barbels four, small. Anal scales not enlarged; the lateral line runs along the middle of the tail. Anal fin short. Pharyngeal teeth?

South Africa.

1. Abrostomus umbratus.

Smith, l. c. pl. 12. fig. 1.

Scales very small. The height of the body is nearly equal to the length of the head, and a little more than one-fifth of the total (without caudal). (*Smith.*)

Streams north of Orange River.

2. Abrostomus capensis.

Smith, l. c. fig. 2.

Scales small. The height of the body is equal to the length of the head, and two-ninths of the total (without caudal). (*Smith.*)

Cape Colony.

To this genus probably belong *Labeo caffer* from the Great Fish River and *Labeo sicheli* from the Orange River, very insufficiently noticed by Castelnau, Poiss. Afr. Austr. p. 60. They are said to have only one small barbel at the corner of the mouth.

15. DISCOGNATHUS*.

Garra, sp., *Ham. Buch.*†
Platycara, *M'Clell. Journ. As. Soc. Beng.* vii. 1838, p. 944.
Discognathus, *Heckel.*
Garra, Discognathichthys, et Lissorhynchus, *Bleeker.*

Scales of moderate size. Dorsal fin without osseous ray, with not more than nine branched rays, commencing somewhat in advance of the ventrals. Snout obtusely rounded, more or less depressed, projecting beyond the mouth, more or less tubercular. Mouth inferior, transverse crescent-shaped; lips broad, continuous, with an inner sharp edge of the jaws covered with horny substance on the lower jaw; upper lip more or less distinctly fringed; *lower lip modified into a suctorial disk,* with free anterior and posterior margins. Barbels two or four; if two, the upper are absent. Anal scales not enlarged; lateral line running along the middle of the side of the tail. Anal fin very short. *Pectoral fins horizontal.* Pharyngeal teeth 5.4.2—2.4.5.

Rivers, especially mountain rivers, of South-western Asia, Continental India, and Ceylon.

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* 1. Platycara notata, *Blyth, Journ. As. Soc. Beng.* 1860, p. 161.—Tennasserim.
2. Gonorhynchus stenorhynchus, *Jerdon, Madr. Journ. Lit. & Sc.* xv. 1849, p. 310.

† The division named *Garra* by Hamilton Buchanan is an odd compound, without any claim to anything like an artificial or natural genus; it thus happens that one of the species is a *Discognathus,* which induced Dr. Bleeker to supersede a most appropriate name given to a most natural genus by the barbarous denomination Garra!

1. Discognathus lamta.

Cyprinus lamta, *Ham. Buch. Fish. Gang.* pp. 343, 393.
—— gotyla, *Gray & Hardw. Ill. Ind. Zool.* fig.
Gonorhynchus rupiculus, *M'Clell. Ind. Cypr.* pp. 281, 373, tab. 43. figs. 4–5.
—— bimaculatus, *M'Clell. l. c.* pp. 281, 373, tab. 43. fig. 2 (cop. from *Hamilton's MS. drawings*).
—— brachypterus, *M'Clell. l. c.* pp. 283, 374.
—— caudatus, *M'Clell. l. c.* p. 375.
Discognathus rufus, *Heckel in Russegger's Reisen*, i. p. 1071, taf. 8. fig. 2.
—— obtusus, *Heckel, l. c.* p. 1072, taf. 8. fig. 3.
—— crenulatus, *Heckel, l. c.* ii. 3. p. 262.
—— fusiformis, *Heckel, in Hügel's Reisen*, iv. p. 387 (with bad figure).
Garra malabarica, *Day, Proc. Zool. Soc.* 1865, p. 297; *or Fish. Malabar*, p. 205, pl. 15. fig. 1 (bad).
Gonorhynchus gotyla, *Jerdon, Madr. Journ. Lit. & Sc.* xv. 1849, p. 309.
? —— m'clellandii, *Jerdon, l. c.* p. 310.
Garra ceylonensis, *Bleek. Mém. Soc. Holland. Harlem*, 1864, *Cobit. & Cyprin. Ceylon*, p. 8, tab. 1. fig. 4. (Coloration taken from a specimen preserved in spirits!)
—— gotyla et lamta, *Steindachner, Sitzgsber. Ak. Wiss. Wien*, lvi. p. , tab. 2.
—— gotyla et jerdoni, *Day, Proc. Zool. Soc.* 1867, p. 288.
—— alta, *Day, l. c.* p. 349.

D. 11. A. 7. L. lat. 33–36. L. transv. 4½/5.

The pectoral fin is as long as, or shorter than, the head, and terminates at some distance from the root of the ventral. Two and a half or three longitudinal series of scales between the lateral line and the root of the ventral fin. A black spot behind the upper end of the gill-opening, sometimes a dark band along the middle of the side, terminating in a spot on the root of the caudal fin.

Rivers and rivulets of South-western Asia and Continental India.

This species extends from Syria to Assam, and, as may be expected in a species of so wide a range, it is subject to some variation. However, the amount of variation which may be observed in examples from extreme limits is considerably less than that found in examples from the same locality and of evidently the same species. Also the differences of form between old and young examples are considerable. The parts most subject to variation are the snout with regard to form, width, and prominence, the width of the cleft of the mouth and labial disk, the barbels, the fringes of the upper lip, the eye, the length or depth of the free portion of the tail. Also the coloration varies, some specimens being uniform, others spotted, others provided with several streaks, others with a median band. A black spot behind the upper part of the gill-opening is most constant.

Having fortunately numerous examples from the most distant localities, I have convinced myself that they ought to be referred to a single species only.

a. Adult. Assam? From Griffith's Collection.

b. Adult. Cachar. Presented by Lieut.-Col. Playfair.
c. Eight inches long. Nepal. Presented by B. H. Hodgson, Esq.
d–f, *g–k*. Adult and half-grown. Nepal. Presented by B. H Hodgson, Esq.
l–n. Half-grown. Cossye River. Presented by Lieut. R. C. Beavan.
o–p. Adult. Ganges. From the Collection of the Zoological Society.
q–r. Adult. Morar River, Gwalior. Presented by Lieut. R. C. Beavan.
s–t. Half-grown. Dekkan. From Col. Sykes's Collection.
u, *v–y*. Adult and young. Seegoor River. Presented by Surgeon Day as *Garra jerdoni*.
z, *α*. Adult, types of *Garra malabarica*. Malabar. From the Collection of Dr. Bleeker and Surgeon Day.
β. Young. Wynaad. Presented by Surgeon Day as *Garra alta*.
γ, *δ*, *ε*, *ζ*, *η*. Numerous adult, half-grown, and young specimens. Ceylon.
ϑ. Adult. India. From the Collection of the East-India Company.
ι. Numerous half-grown and young specimens. Ramoth-Gilead, Palestine. From the Collection of the Rev. H. B. Tristram.

2. Discognathus macrochir.

Closely allied to *D. lamta*, from which it differs in the following points:—

D. 11. A. 7. L. lat. 34. L. transv. 4/5.

Pectoral fin longer than the head, terminating at a very short distance from the root of the ventral fin. Two longitudinal series of scales between the lateral line and the root of the ventral fin. Body much elongate, its greatest depth being less than the length of the head, which is one-fifth of the total (without caudal); head much depressed, its width being not much less than its length. Width of the mouth equal to that of the interorbital space. Snout equally depressed, not constricted before the eyes. Eye very small. Barbels four, small. Caudal fin scarcely emarginate, with the lobes equal in length. Chest and middle of abdomen naked, postpelvic region covered with very large scales. Sides of the body clouded with darker. A small black spot behind the upper end of the gill-opening.

Assam.

a. Three and a half inches long. From the Collection of the East-India Company.
b. Three and a half inches long. From Griffith's Collection.

3. Discognathus nasutus.

Platycara nasuta, *M'Clell. Journ. As. Soc. Beng.* vii. p. 947, tab. 55. figs. 2 *a* & *b*; or *Ind. Cypr.* pp. 300, 428, tab. 57. fig. 2.

Snout with a constriction before the eyes. L. lat. 34. (*M'Clell.*)
Khassyah Mountains.

4. Discognathus variabilis.

Heckel, in Russegger's Reisen, i. p. 1069, taf. 8. fig. 1.

D. 10. A. 7. L. lat. 38–40. L. transv. 5/?.

Two barbels only at the angle of the mouth. The pectoral fin is shorter than the head, and terminates at a great distance from the root of the ventral. Four longitudinal series of scales between the lateral line and the root of the ventral fin. Coloration variable. (*Heckel.*)

Rivers of Syria and Tigris.

16. CROSSOCHILUS *.

Gonorhynchus, sp., *M'Clelland.*
Cirrhina, sp., *Cuv. & Val.*
Dangila, sp., Mrigala, sp., et Cirrhinichthys, *Bleeker.*
Crossocheilus (*V. Hass.*) et Crossocheilichthys, *Bleeker.*

Scales of moderate size. Dorsal fin without osseous ray, with not more than nine branched rays, commencing somewhat in advance of the ventrals. Snout obtusely rounded, without lateral lobe; lower jaw transverse, with a narrow lip, not continuous with the upper lip, and with a sharp inner transverse edge; upper lip generally fringed. Barbels two or four; if two, the upper only are present. Anal scales not enlarged; lateral line running along the middle of the tail. Anal fin very short. Pharyngeal teeth 5 . 4 . 2—2 . 4 . 5.

East Indies.

The species may be divided thus—

a. Upper lip distinctly fringed, p. 71.
β. Upper lip indistinctly fringed or entire, p. 74.

a. Upper lip distinctly fringed.

1. Crossochilus latius.

Cyprinus latius, *Ham. Buch. Fish. Gang.* pp. 345, 393.
Gonorhynchus macrosomus, *M'Clell. Ind. Cypr.* p. 372, tab. 43. fig. 7 (copied from *Buchanan's MS. drawings*).
Crossocheilus latius, *Bleek. Prodr. Cypr.* p. 110 (name only).

D. 11. A. 7. L. lat. 39. L. transv. $5\frac{1}{2}/6\frac{1}{2}$.

Barbels four, the upper of which are shorter than the eye, the lower being rudimental or entirely absent. The height of the body is nearly equal to the length of the head, which is two-elevenths of the total (without caudal). Eyes situated somewhat behind the middle of the length of the head. Three and a half longitudinal series of scales between the lateral line and the root of the ventral fin. Coloration uniform.

Mountain-streams of Northern Bengal, Nepal, and Assam.

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* 1. Cyprinus mosario, *Ham. Buch. Fish. Gang.* pp. 346, 393; Gonorhynchus gobioides, *M'Clell. Ind. Cypr.* p. 369, tab. 43. fig. 1 (very bad); ? Crossocheilos gobioides, *Bleek. Prodr. Cypr.* p. 110 (name only).—Bengal Assam.—Said to be without barbels.

a–f. Adult. Nepal. Presented by B. H. Hodgson, Esq.
g–h. Half-grown: in bad state. Cachar. Presented by Lieut.-Col. Playfair.

2. Crossochilus gohama.

Cyprinus gohama, *Ham. Buch. Fish. Gang.* pp. 346, 393.
Gonorhynchus brevis, *M'Clell. Ind. Cypr.* p. 373, tab. 43. fig. 6 (copied from *Buchanan's MS. drawing*).
Crossocheilus gohama, *Bleek. Prodr. Cypr.* p. 110 (name only).

D. 11. A. 7. L. lat. 36. L. transv. 5½/6.

Two barbels only, shorter than the eye. Three longitudinal series of scales between the lateral line and the root of the ventral fin. The height of the body is a little less than one-fourth of the total length (without caudal), the length of the head one-fifth. The eye is situated a little before the middle of the length of the head; its diameter is three-fourths of the length of the snout, and two-sevenths of that of the head. Body irregularly spotted with brown.

Bengal.

a. Three and a half inches long. Calcutta. From the Collection of Messrs. v. Schlagintweit.

3. Crossochilus rostratus.

D. 11. A. 7. L. lat. 38. L. transv. 5½/7.

Two barbels only, shorter than the eye. Four longitudinal series of scales between the lateral line and the root of the ventral fin. The height of the body is somewhat more than the length of the head, which is one-fifth of the total (without caudal). Snout long, conical, much protruding beyond the mouth. Eye large, two-sevenths of, and situated somewhat behind the middle of, the length of the head. Origin of the dorsal fin considerably in advance of that of the ventrals, and equidistant from the end of the anal and the extremity of the snout. Pectoral fin a little longer than the head, terminating at a great distance from the ventral. A black spot (composed of about four smaller spots) on the fifth and sixth scales of the lateral line.

Cossye River.

a. Four inches long. Presented by Lieut. R. C. Beavan.

4. Crossochilus barbatulus.

Barbus diplochilus, *Heckel, Fische aus Caschmir*, p. 53, tab. 10. fig. 1.
Tylognathus barbatulus, *Heckel, in Hügel's Reise*, iv. p. 376, and *in Russegger's Reisen*, ii. 3. p. 283 (name only).
Crossocheilus diplochilus, *Steindachner, Verhandl. zool.-bot. Ges. Wien*, 1866, p. 791.

D. 11. A. 7. L. lat. 36–39. L. transv. 4½/6.

Four small barbels, the lower being rudimental or entirely absent. Snout thick, much projecting beyond the lower jaw. Eye of moderate size, in or somewhat before the middle of the length of the head.

There are three and a half longitudinal series of scales between the lateral line and the root of the ventral fin. Body rather elongate, its depth being less than the length of the head, which is contained four times and one-third in the total (without caudal). The origin of the dorsal fin is considerably in advance of that of the ventral, and nearer to the end of the snout than to the root of the caudal. Caudal fin deeply forked. Silvery; body with very indistinct, irregular, blackish dots.

Kashmere. Four inches long.

a. Three inches long. Kashmere. From the Collection of Messrs. von Schlagintweit.

5. Crossochilus oblongus.

Labeo oblongus, *Cuv. & Val.* xvi. p. 357.
Crossocheilus oblongus (*Van Hass.*), *Bleek. Nat. Tydschr. Ned. Ind.* v. p. 525; or *Prodr. Cypr.* p. 124; or *Atl. Ichthyol. Cypr.* p. 40, tab. 4. fig. 3.

D. 11. A. 7. L. lat. 33. L. transv. $4\frac{1}{2}/5$.

Two barbels only. Three longitudinal series of scales between the lateral line and the root of the ventral fin. The height of the body is two-ninths or one-fifth of the total length (without caudal); the length of the head two-elevenths. The eye is situated a little behind the middle of the length of the head, and is two-thirds of that of the snout. Coloration uniform, sometimes a dark band along the middle of the side.

Java and Sumatra.

a, b, c. Six inches long. East-Indian archipelago.

6. Crossochilus cobitis.

Lobocheilos cobitis, *Bleek. Nat. Tydschr. Ned. Ind.* v. p. 523.
Crossocheilus (Crossocheilichthys) cobitis, *Bleek. Prodr. Cypr.* p. 125; or *Atl. Ichthyol. Cypr.* p. 40, tab. 4. fig. 2.

D. 11. A. 7. L. lat. 32. L. transv. $4\frac{1}{2}/5\frac{1}{2}$.

Barbels four, the upper of which are longer than the lower, and much shorter than the eye. Three longitudinal series of scales between the lateral line and the root of the ventral fin. The height of the body is nearly equal to the length of the head, which is two-ninths of the total (without caudal). The eye occupies the middle of the length of the head, and its diameter is three-fourths of that of the snout. A silvery band runs along the side, in the middle of which sometimes runs a dark streak. A round blackish spot on the end of the lateral line.

Java and Sumatra.

a. One of the typical specimens, $2\frac{1}{4}$ inches long. From Dr. Bleeker's Collection.

This is, perhaps, merely the young of *C. oblongus*.

7. Crossochilus langii.

Crossocheilus (Crossocheilichthys) langei, *Bleek. Prodr. Cypr.* p. 127; or *Atl. Ichthyol. Cypr.* p. 41, tab. 4. fig. 1.

D. 11. A. 7. L. lat. 33. L. transv. 4½/4½.

Barbels four, the upper of which are longer than the lower, but rather shorter than the eye. Two and a half longitudinal series of scales between the lateral line and the root of the ventral fin. The height of the body is one-fifth of the total length (without caudal), the length of the head two-ninths. The eye is two-sevenths of the length of the head, situated a little behind its middle, and three-fourths of the extent of the snout. A brownish band runs along the lateral line, and terminates in a black spot on the middle of the caudal fin. A blackish spot between vent and anal fin.

Sumatra.

a. Type of the species, 3 inches long. Palembang. From Dr. Bleeker's Collection.

8. Crossochilus sada.

Cyprinus sada, *Ham. Buch. Fish. Gang.* pp. 344, 393.
Gonorhynchus fimbriatus, *M'Clell. Ind. Cypr.* pp. 282, 375, tab. 43. fig. 3 (cop. from *Hamilton's MS. drawings*).

D. 10. A. 7.

Scales large. Barbels four, much longer than the eye, but shorter than the head. Coloration uniform. (*H. B.*)

Brahmaputra River.

β. Upper lip indistinctly fringed or entire.

9. Crossochilus reba.

Cyprinus reba, *Ham. Buch. Fish. Gang.* pp. 280, 386.
Gobio limnophilus, *M'Clell. Ind. Cypr.* pp. 279, 358, tab. 55. fig. 3 (not tab. 58. fig. 2).
Cirrhina dussumieri, *Cuv. & Val.* xvi. p. 291, pl. 480.
—— reba, *Cuv. & Val.* xvi. p. 292.
—— bengalensis, *Bleek. Verh. Bat. Gen.* xxv. *Beng. & Hind.* p. 136.
Mrigala bengalensis, *Bleek. Prodr. Cypr.* p. 226 (name only).
Cirrhinichthys (!) dussumieri, *Bleek. Atl. Ichth. Cypr.* p. 28.
Cirrhina rewah, *Steindachner, Sitzgsber. Ak. Wiss. Wien.* lvi. p.

D. 11. A. 7. L. lat. 35–38. L. transv. 7/7.

The upper barbels only are present, and shorter than the eye; upper lip of young individuals generally indistinctly fringed, of old ones entire. Four or five longitudinal series of scales between the lateral line and the root of the ventral fin. The height of the body is one-fourth or rather more than one-fourth of the total length (without caudal), the length of the head one-fifth. The eye is situated somewhat before the middle of the length of the head. Coloration uniform.

East-Indian continent.

a. Young. Siam. From M. Mouhot's Collection.
b–c. Half-grown. Cachar. Presented by Lieut.-Col. Playfair.
d–e. Adult; stuffed. Calcutta.
f. Young. Calcutta. From the Collection of Messrs. von Schlagintweit.
g. Young. River Hooghly. From Dr. Bleeker's Collection. Type of his *Mrigala bengalensis*.
h. Young. Ganges. From the Collection of the Zoological Society.
i–k. Half-grown. Cossye River. Presented by Lieut. R. C. Beavan.
l. Adult: skin. Chenab. From Griffith's Collection.
m. Adult: stuffed. Seharunpore.
n–o. Adult: skins. Loodianah. From Griffith's Collection.
p–q. Young. Indus. From the Collection of Messrs. von Schlagintweit.
r–s. Young. River Cavery. Presented by Capt. Mitchell.
t. Young. Nilgherries. Purchased of Mr. Day.
u. Young. Ceylon. From the Collection of Messrs. von Schlagintweit.
v–w. Adult: stuffed. From the Collection of the East-India Company.

Varietas:—

A blackish band runs along the lateral line.

a. Young. Calcutta. From the Collection of Messrs. von Schlagintweit.

16*a*. GYMNOSTOMUS*.

Gymnostomus, sp., *Heckel, in Russegger's Reisen*, i. p. 1030.
Acra, *Bleeker, Prodr. Cypr.* p. 230.

A number of species from the Indian continent, incompletely described by Buchanan Hamilton, M'Clelland, Valenciennes, and Sykes, have been united by Heckel and Bleeker under the denominations referred to. Neither of the two latter ichthyologists knew one of those species from autopsy; nor can the creation of those generic names be regarded as a progress towards a better knowledge of them. It is very doubtful whether one of these fishes is really the type of a separate genus, or whether all of them will not finally prove to be *Tylognathus*, *Crossochilus*, or some other genus.

The uncertainty attached to every attempt at referring these fishes to better-known genera induces me to leave them united under the denomination first proposed. They appear to agree in having a short dorsal without osseous ray above the ventrals, a still shorter anal, the mouth inferior, transverse, lower jaw said to be sharpened, without labial fold, no barbels, lateral line running along the middle of the tail. Their intestinal tract is very long, and *the liver* of some of the species at least *broken up into numerous glands distributed over various parts of the abdomen.*

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* There is some difficulty in choosing between the names of *Gymnostomus* and *Acra*; the former might be used for a division of *Capoëta* (*Chondrostoma syriacum*, Cuv. & Val. = *Gymnostomus syriacus*, Heck.); the second could be used for *Cyprinus acra*, H. B., only, which is probably a *Cirrhina*. However, in an artificial assemblage of species like this, it is of no consequence which name is temporarily retained for it.

The species referred to this artificial group, which I have not otherwise identified, are:—

1. *Gobius bicolor,* M'Clell. Ind. Cypr. pp. 278, 360, pl. 40. fig. 1. From northern Assam. D. 12. A. 7. L. lat. 42. Snout depressed, long; mouth semicircular, placed horizontally on the lower surface of the snout.

2. *Chondrostoma gangeticum,* Cuv. & Val. xvii. p. 399, from the Ganges. D. 10. A. 7. L. lat. 33. This ought to be compared with *Crossochilus reba.*

3. *Chondrostoma semivelatus,* Cuv. & Val. xvii. p. 402, from Madras. D. 12. A. 7. L. lat. 40.

4. *Chondrostoma duvaucelli,* Cuv. & Val. xvii. p. 403, from Madras. D. 11. A. 7. L. lat. 40. Pharyngeal teeth 4 . 3 . 3—3 . 3 . 4; interorbital space broad.

5. *Chondrostoma fulungee,* Sykes, Trans. Zool. Soc. ii. p. 358. Dekkan.

6. *Chondrostoma mullya,* Sykes, *l. c.* p. 359, tab. 62. fig. 3. Beema River.

7. *Chondrostoma wattanah,* Sykes, *l. c.* p. 360, tab. 62. fig. 4. Beema River.

17. EPALZEORHYNCHUS.

Epalzeorhynchus, *Bleeker, Nat. Tydschr. Ned. Ind.* ix. p. 279.

Scales of moderate size Dorsal fin without osseous ray, with not more than nine branched rays, commencing somewhat in advance of the ventrals. Snout obtusely rounded, swollen, with a free moveable lateral lobe, the base of which is formed by bone. Lower jaw transverse, with a broad double lip, continuous with the upper, and with a sharp bony inner transverse edge · upper lip fringed. Barbels four, small. Anal scales not enlarged; lateral line running along the middle of the tail. Anal fin very short. Pharyngeal teeth 5 . 4 . 2—2 . 4 . 5.

East-Indian archipelago.

1. Epalzeorhynchus callopterus.

Barbus kalopterus, *Bleek. Nat. Tydschr. Ned. Ind.* i. p. 13.
Epalzeorhynchus kalopterus, *Bleek. l. c.* ix. p. 270; *Prodr. Cypr.* p. 118; or *Atl. Ichthyol. Cypr.* p. 38, tab. 4. fig. 5.

D. 11. A. 7. L. lat. 35. L. transv. $5\frac{1}{2}/7$.

Barbels subequal in length, as long as the eye. Five series of scales between the lateral line and the root of the ventral fin. The height of the body is two-ninths of the total length (without caudal), the length of the head one-fifth. A broad brown band runs from the head, above the lateral line, to the end of the middle caudal rays, and is separated from the dark coloration of the back by a lighter streak. Dorsal and anal fins with a broad, oblique, black band.

Sumatra and Borneo.

a. Type of the species. From Dr. Bleeker's Collection.

18. CAPOETA*.

Capoeta, sp., et Chondrostoma, sp., *Cuv. & Val.*
Scaphiodon, sp., Dillonia et Gymnostomus, sp., *Heckel in Russegger, Reisen*, i. 1842 (Oct.) p. 1020, and ii. 3. pp. 285–287.

Scales small, of moderate or large size. Dorsal fin with or without a strong, osseous ray, with not more than nine branched rays, opposite to the ventrals. Snout rounded, with the mouth transverse and at its lower side; each mandible angularly bent inwards in front, the anterior mandibular edge being nearly straight, sharpish, and covered with a horny brown layer. No lower labial fold. Barbels two (four in *C. tinca*), or entirely absent. Anal scales not conspicuously enlarged. Pharyngeal teeth compressed, truncated, 5 or 4 . 3 . 2—2 . 3 . 4 or 5.

Rivers of Western Asia.

On the *skeleton* see *Capoeta damascina*, p. 78.

The species may be subdivided thus:—

A. Scales small.
  a. An osseous dorsal ray: *Capoeta*.
    α. Barbels two, p. 77.
    β. Barbels four, p. 80.
  b. No osseous dorsal ray: *Gymnostomus*, p. 81.
B. Scales of large or moderate size: *Dillonia*, p. 81.

A. *Scales small.*

a. *An osseous dorsal ray*: Capoeta.

α. Barbels two.

1. Capoeta damascina.

Gobio damascinus, *Cuv. & Val.* xvi. p. 314, pl. 482.
Scaphiodon capoëta, *Heckel in Russegger's Reisen*, i. p. 1057, taf. 5.

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* 1. Cyprinus capoeta, *Güldenstädt, Nov. Comm. Acad. Sc. Petropol.* xvii. 1773, p. 507, tab. 8; Cyprinus fundulus, *Pall. Zoogr. Ross.-As.* iii. p. 294; Capoeta fundulus, *Cuv. & Val.* xvi. p. 279.—Caspian Sea, River Cyrus.

2. Cyprinus labeo, *Pallas, Nov. Act. Acad. Sc. Petropol.* i. 1787, p. 355, tab. 11. figs. 8, 9 (bad); *Zoogr. Rosso.-As.* iii. p. 305; from the tributaries of the Upper Amur. Our knowledge of this fish is very incomplete, and its position in the system doubtful; it may be a *Chondrostoma*.

3. Scaphiodon saadii, *Heckel, in Russegger's Reisen*, ii. 3. p. 260. Persepolis.—L. lat. 75–78.

fig. 1 (not *Güldenst.*); *Steindachner, Verhandl. zool.-bot. Gesellsch. Wien*, 1864, p. 223.
Scaphiodon socialis, *Heckel, l. c.* i. p. 1061, and ii. 2. p. 217, taf. 15. fig. 2.
—— rostratus, *Keyserling, Zeitschr. ges. Ntrwiss.* xvii. p. 7, taf. 3.
—— chebisiensis, *Keyserling, Zeitschr. ges. Ntrwiss.* xvii. p. 5, taf. 2.

D. 11. A. 8. L. lat. 70–78. L. transv. $\frac{14-17}{16}$. Vert 26/19.

The osseous dorsal ray is rather feeble, finely serrated. There are eleven or twelve series of scales between the lateral line and the ventral fin. The length of the head is one-fifth of the total (without caudal); eye small; snout obtuse. The origin of the dorsal fin is a little nearer to the end of the snout than to the root of the caudal; anal fin narrow and deep. Coloration uniform.

Syria, Palestine, and Asia Minor.

a–e. Adults. Jordan. From the Collection of the Rev. H. B. Tristram.
f–h. Adult. Lake of Galilee. From the Collection of the Rev. H. B. Tristram.
i–m. Half-grown and young. Lake of Galilee. Collected by Th. W. Beddome, Esq.
n–o. Adult. Bahr el Kelb. From the Collection of the Rev. H. B. Tristram.
p. Half-grown. Wady el Kurm. From the Collection of the Rev. H. B. Tristram.
q. Numerous young examples. Dead Sea. From the Collection of the Rev. H. B. Tristram.
r–t. Adult (13 inches long) and half-grown. Palestine. From the Collection of the Rev. H. B. Tristram.
u–w. Half-grown. Lake Van (Erzeroum). From the Collection of the Zoological Society.
x. Skeleton: adult. Palestine. From the Collection of the Rev. H. B. Tristram.

Heckel identified this species with the *Cyprinus capoëta* of Güldenstädt from the Caspian Sea; however, this is evidently a species with larger scales, for Güldenstädt gives as the dimensions of a scale, in a specimen of 12½ inches long, 3½ lines by 1¼ line (English). In a specimen from Palestine of nearly the same size one of the largest scales is only 3 lines long and 2⅓ lines broad.

I have been assisted in the identification of this fish by Prof. Duméril, who, at my request, examined the typical specimen of *Gobio damascinus*, and informed me that the osseous dorsal ray is strongly serrated in its lower third or fourth.

This species is very common in Palestine, Syria, and Asia Minor, and subject to individual variations with regard to the size of the eye, form of the snout, length of anal and caudal fin.

Skeleton.—In the structure of the skull this species much resembles *Labeo*. The bones of the upper jaw are broad and thin; the symphysial transverse portion of the mandible is not dilated, and forms rather more than a right angle with the posterior portion. Inner ridges of the humeral arch not dilated. The occipital process for the cartilaginous masticatory lamina consists of two parts; the anterior is concave, very broad, cordiform, the apex passing into the slender posterior portion, which reaches the median apophysis of the third vertebra, to which the upper end of the air-bladder is attached. This median apophysis is a triangular lamina, with its middle nearly entirely ossified. A series of irregular broad interneural elements runs from the occipital crest to the origin of the dorsal fin, as in *Labeo* and *Tylognathus.* The interneural spines of the dorsal fin correspond to the neurals of the thirteenth to twenty-second vertebræ.

Scaphiodon peregrinorum, Heckel, *l. c.* i. p. 1061, and ii. 3. p. 219, taf. 15. fig. 3 (with L. lat. 77–80), is perhaps not specifically distinct from *C. damascina.*

2. Capoeta fratercula.

Scaphiodon fratercula, *Heckel, l. c.* i. p. 1059, taf. 5. fig. 2.

D. 12. A. 8. L. lat. 61–62. L. transv. 10/?

Osseous dorsal ray rather feeble, but very conspicuously and finely serrated. There are about eight longitudinal series of scales between the lateral line and the root of the ventral fin. The length of the head is contained four times and three-fourths in the total (without caudal); eye rather small; snout obtuse. The origin of the dorsal fin is somewhat nearer to the root of the caudal than to the end of the snout. Anal fin rather deep and narrow. Coloration uniform. (*Heck.*)

Damascus.

Scaphiodon niger, Heckel, *l. c.* ii. 3. p. 258, from the Araxes, is said to be distinguished from the above species by a black coloration, and by having the teeth of the serrature of the osseous dorsal ray nearly vertical to the axis of the ray.

3. Capoeta amir.

Scaphiodon amir, *Heckel, in Russegger's Reisen,* ii. 3. p. 258.

Very closely allied to *C. socialis.*

D. 11–12. A. 8. L. lat. 70–72. L. transv. 13/?.

Osseous dorsal ray feeble, the teeth of serrature being vertical to the axis of the bone. There are eight longitudinal series of scales between the lateral line and the root of the ventral fin. The length of the head is contained five times and one-third in the total (with the caudal); eye small. Coloration uniform. (*Heck.*)

River Araxes.

4. Capoeta umbla.

Scaphiodon umbla, *Heck. l. c.* p. 1060, taf. 5. fig. 3.

D. 14. A. 8. L. lat. 90–96. L. transv. 18/?.

Osseous dorsal ray feeble, finely serrated. The length of the head is one-fifth of the total (without caudal); eye rather small; snout obtuse. The origin of the dorsal fin is somewhat nearer to the end of the snout than to the root of the caudal. Anal fin deep and narrow. Coloration uniform. (*Heck.*)

River Tigris.

5. Capoeta trutta.

Scaphiodon trutta, *Heckel, l. c.* i. p. 1056, taf. 4. fig. 3.

D. 12. A. 8. L. lat. 77–82. L. transv. 16/26.

The osseous dorsal ray is very strong, considerably longer than the head, strongly serrated. Scales on the lower part of the side of the abdomen very small. The length of the head is one-fifth of the total (without caudal); eye small. The origin of the dorsal fin is midway between the end of the snout and the root of the caudal. Anal fin not very deep. Head and body with black specks.

Syria; River Tigris.

a. Skin, 17 inches long. Presented by W. K. Loftus, Esq.

6. Capoeta gracilis.

Scaphiodon gracilis, *Keyserling, Zeitschr. ges. Ntrwiss.* xvii. p. 9, taf. 4.

—— sieboldii, *Steindachner, Verh. zool.-bot. Ges. Wien*, 1864, p. 224.

Capoeta sevangi, *De Filippi, Viaggio in Persia*, p. 312.

D. 12. A. 8. L. lat. 55. L. transv. 10/?.

Osseous dorsal ray feeble, finely serrated. The length of the head is one-fourth of the total (without caudal); eye of moderate size. The origin of the dorsal fin is midway between the end of the snout and the root of caudal. Anal fin deep. There are nine longitudinal series of scales between the lateral line and ventral fin. Coloration uniform.

Persia.

β. *Barbels four.*

7. Capoeta tinca.

Scaphiodon tinca, *Heckel, l. c.* i. p. 1021.

D. 11. A. 7. L. lat. 76–80. L. transv. 17/?.

Four very short barbels. Osseous dorsal ray rather feeble, deeply serrated. There are nine longitudinal series of scales between the lateral line and the root of the ventral fin. The length of the head is one-fifth of the total (without caudal). Anal fin as high as dorsal. (*Heck.*)

Brussa in Anatolia.

8. Capoeta heratensis.

Scaphiodon heratensis, *Keyserling, Zeitschr. ges. Ntrwiss.* xvii. p. 11, taf. 5.

—— asmussii, *Keyserling, l. c.* p. 14, taf. 6 (probably adult female).

D. 12. A. 8. L. lat. 57. L. transv. 10–11/?.

Four barbels, about as long as the eye. Osseous dorsal ray feeble, serrated. There are ten longitudinal series of scales between the lateral line and ventral fin. The length of the head is one-fifth of the total (without caudal). Origin of the dorsal fin nearly midway between the end of the snout and root of the caudal. Body color irregular, scattered dark spots. (*Keys.*)

Vicinity of Herat, also in warm springs.

b. *No osseous dorsal ray*: Gymnostomus.

9 Capoeta micracanthus.

D. 11. A. 7. L. lat. 140.

Body elongate; head very small, though thick, its length being one-fifth or one-sixth of the total (without caudal). Snout broad, of moderate length, the eye being rather nearer to its end than to that of the gill-cover; barbels small. Origin of the dorsal fin midway between the end of the snout and the root of the caudal. Anal fin very narrow and deep. Interorbital space broad, slightly convex; eye small. Snout of certain specimens covered with pointed conical tubercles.

Bhotan.

a–d. Stuffed. from 18 to 23 inches long. Punakha. From the Collection of the East-India Company.

10. Capoeta syriaca.

Chondrostoma syriacum, *Cuv. & Val.* xvii. p. 407, pl. 514.
Gymnostomus syriacus, *Heckel, l. c.* (name only).

D. 12. A. 7. L. lat. 80.

The height of the body is more than the length of the head, which is nearly one-fifth of the total (without caudal). Snout thick and rounded. Two barbels only, at the corners of the mouth. Eye small. (*Val.*)

Abraham's River, at the foot of Mount Sinai.

B. *Scales of large or moderate size*: Dillonia.

11. Capoeta dillonii.

Chondrostoma dillonii, *Cuv. & Val.* xvii. p. 404.
Dillonia dilonii, *Heckel, in Russegger's Reisen,* ii. 3. p. 285 (name only).

D. 9. A. 7. L. lat. 30.

Dorsal fin with a strong, osseous, non-serrated ray; snout rounded, obtuse, without barbels. Mouth inferior, arched. The height of the body is more than the length of the head, and one-fourth of the total (with the caudal); caudal fin but little forked. Eye one-fifth of the length of the head. Coloration uniform. (*Val.*)

Abyssinia.

12. Capoeta aculeata.

Chondrostoma aculeatum, *Cuv. & Val.* xvii. p. 408.

D. 10. A. 8. L. lat. 38.

Third dorsal ray serrated. A very small barbel on each side of the mouth. The height of the body equals the length of the head, and is two-elevenths of the total (without caudal). (*Val.*)

Persia.

13. Capoeta macrolepis.

Scaphiodon macrolepis, *Heckel, l. c.* ii. 3. p. 259.

D. 11. A. 8. L. lat. 43–44. L. transv. 7/?.

Osseous dorsal ray serrated. Mouth inferior, transverse, with two very short barbels. The height of the body is rather more than the length of the head, which is less than one-sixth of the total (with the caudal). Coloration uniform. (*Heck.*)

River Araxes.

19. BARBUS*

Barbus, sp., *Cuv. Règne Anim.*
Cyprinus, sp., et Puntius, *Ham. Buch.*
Labeobarbus et Varicorhinus, *Rüpp. Mus. Senckenb.* ii. 1837, p. 14.
Barbus et Systomus, *M'Clelland.*
Barbus, sp., Labeobarbus et Capoëta, sp., *Cuv. & Val.*
Pseudobarbus, *Bielz.*
Systomus, Barbus, Labeobarbus et Luciobarbus, *Heckel.*
Barbus, Pseudobarbus et Cheilobarbus, *A. Smith.*
Barbus, Labeobarbus, Balantiocheilus, Hemibarbus, Cyclocheilichthys, sp., Siaja, sp., Anematichthys, Hypselobarbus, sp., Gonoproktopterus, Puntius, Barbodes, Capoëta, Puntius, Gnathopogon et Hampala, *Bleeker.*
Enteromius, *Cope, Trans. Am. Philos. Soc.* xiii. p. 405.

Scales of small, moderate, or large size. Dorsal fin generally with the (third) longest simple ray ossified, enlarged, and frequently serrated; never, or only exceptionally*, with more than nine branched rays, commencing opposite, or nearly opposite, the root of the ventral fin. Eyes without adipose eyelid. Anal fin very short, but frequently very high. Mouth arched, without inner folds, inferior or anterior; lips without horny covering. Barbels short, four, two, or none. Lateral line running in, or nearly in, the middle of

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* *Barbels four*:—

1. Barbus canalii, *C & V.* xvi. p. 143.—Perugia.
2. —— peloponnesius, *C. & V.* xvi. p. 144.—Morea.
3. Cyprinus mursa, *Güldenstädt, Nov. Comm. Petropol.* xvii. 1773, p. 513, tab. 9; Cyprinus mystaceus, *Pall. Zoogr. Ross.-As* iii. p. 293; Barbus mystaceus, *Nordm. in Demid. Voy. Russ. Mérid.* iii. 474.—Rivers of Russian Georgia.—Evidently allied to *B. fluviatilis* or *B. plebejus*, with very small scales, a strong serrated spine, elongate head and body, 43 vertebræ, &c.
4. Cyprinus capito, *Güldenstädt, l. c.* p. 518; *Pallas, l. c.* p. 294; Barbus capito, *Nordmann, l. c.* p. 475.—River Kur.—Güldenstädt says, "Differt a *Barbo*: capite longiore, latiore, minus depresso; rostro obtusiore; cirrhis longioribus; oculis majoribus; corpore aliquantum magis compresso; pinna dorsali a rostro multo remotiori; tandem colore laterum infra lineam et pinnis inferioribus omnibus luteis; vertebris 47." Pallas adds that it is a large-scaled species (?).
5. Cyprinus arabicus, (*Ehrenberg*) *C. & V.* xvi. p. 202.—This name may be properly erased from the system.
6. Barbus malabaricus, *Jerdon, Madr. Journ. Lit. & Sc.* xv. 1849, p. 312.—

Mountain-streams in Malabar.—L. lat. 23; dorsal spine not serrated; 4 long barbels; head to whole body (?) as 1 : 4 &c.—Day, in his 'Fishes of Malabar,' does not even mention this insufficiently characterized species.

7. Barbus mysorensis, *Jerdon*, *l. c.*—Cavery.—The author does not even describe the dorsal spine! L. lat. 38.
8. —— mussullah, *Sykes*, *Trans. Zool. Soc.* ii. p. 356, tab. 61. fig. 4.—Dekkan.
9. —— punter, *Bleek. Nat. Tydschr. Ned. Ind.* xiii. p. 350; Systomus *or* Puntius (Barbodes) punter, *Bleek. Prodr. Cypr.* p. 340; or *Atl. Ichthyol. Cypr.* p. 101, tab. 38. fig. 3.—Java.
10. Kadoon, *Russell*, no. 206.—Lake at Ankapilly.—This fish cannot be recognized, except with specimens from the locality mentioned.
11. Kakoo, *Russell*, no. 205; Barbus kakus, *C. & V.* xvi. p. 153.—Tank near Tartoor. Also this species cannot be recognized without specimens from the locality where the typical examples had been obtained; it is said to closely resemble the European barbel; dorsal ray serrated.
12. Barbus subnasutus, *C. & V.* xvi. p. 154.—Pondicherry.—Dorsal ray serrated. L. lat. 29.
13. —— roseipinnis, *C. & V.* xvi. p. 169.—Pondicherry.—Dorsal ray serrated. L. lat. 22.
14. —— rododactylus, *M'Clell. Ind. Cypr.* p. 273.—Lower Assam.—Description perfectly insufficient.
15. —— cyri, *De Filippi, Viaggio in Persia*, p. 358 (Zoolog. Record, ii. p. 201).—From the Kur near Tiflis.—Dorsal spine serrated.—L. lat. 66.
16. Barbus natalensis, *Castelnau, Poiss. Afr. Austr.* p. 59.—Natal.—Dorsal spine smooth.—L. lat. 48.
17. Labeobarbus aureus, *Cope, Journ. Ac. Nat. Sc. Philad.* 1866, p. 406.—Umooti Mission, South Africa.—L. lat. 37.

Barbels two:—

1. Systomus carnaticus, *Jerdon*, *l. c.* p. 315.—Foot of the Nhilgerries and River Cavery.—L. lat. 24.
2. —— tristis, *Jerdon*, *l. c.* p. 316.—River Cavery. L. lat. 24.
3. Cyprinus curmuca, *Buchanan, Journ. to Mysore*, iii. p. 334, pl. 30; *Ham. Buch. Fish. Ganges*, pp. 294–387.—Southern India.—No osseous dorsal ray.

Barbels none:—

1. Cyprinus guganio, *Ham. Buch. Gang. Fish.* p. 338.—Gangetic provinces.—Osseous dorsal ray denticulated; coloration uniform.
2. Systomus tripunctatus, *Jerdon, Madr. Journ. Lit. & Sc.* xv. 1849, p. 316.—Canara.—L. lat. 23; two black spots under end of dorsal, and another at base of tail.
3. —— rubrotinctus, *Jerdon*, *l. c.*—Manantoddy River, a tributary of the Cavery.—L. lat. 20; a small black spot under dorsal, a second over the anal, a third near the base of the caudal. Third dorsal ray not noticed!

Number of barbels not known:—

1. Systomus (?) unimaculatus, *Blyth, Journn. As. Soc. Beng.* 1860, p. 159.—Sitang River (Tennasserim).

* See *Barbus beddomii*, p. 110, *Barbus luteus*, p. 141.

the side of the tail. Anal scales not enlarged. Pharyngeal teeth 5 . 4 or 3 . 3 or 2—2 or 3 . 3 or 4 . 5.

Snout but rarely with tubercles or pore-like grooves.

Temperate or tropical parts of the Old World.

Many attempts have been made to divide the Barbels into generic groups, as may be seen from the synonymy. And, indeed, when we consider the great number of the species, and the great apparent diversity between the first and last in the series, a further division must appear to be highly desirable. Yet nothing would be more contrary to the idea of natural genera, the transition from one extreme species to the other being perfect; and those attempts at generic subdivisions prove that the naturalists who proposed them had only a partial acquaintance with the species. The size of the scales, the development of the third dorsal ray, the form of the snout (and consequently of the præorbital) are perfectly useless as generic characters, in consequence of the complete series of intermediate forms. The lips are subject to variation in the same species; thus, for instance, some specimens of *B. bynni* would belong to *Barbus*, others to *Labeobarbus*. Even the number of barbels is not quite constant, and much caution is required in determining whether a specimen belongs to a species normally with four or two, or without barbels, as these organs are sometimes quite rudimental, and, abnormally, may be entirely absent: this is principally the case with the upper barbel, which I have found sometimes on one side and not on the other. Yet on such characters have naturalists ventured to found genera!

Synopsis of the Species.

I. Normally four barbels.
    A. Scales small or of moderate size, more than forty in the lateral line.
        1. None of the anal rays prolonged beyond the margin of the fin; snout without tubercles or pores*.
            a. The third dorsal ray is osseous and serrated: Europe, Western Asia (Africa), p. 86.
            b. The third dorsal ray is not enlarged: Europe (Africa), p. 94.
        2. Snout with tubercles or pores; third dorsal ray osseous, serrated: India.

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* I have observed in some species that certain individuals have semiglobular or conical tubercles on the snout. These tubercles appear to be developed at certain seasons of the year; and before their development, and after they have dropped off, their bases appear as hollow impressions or as pores. Other species appear to have such pores only, and tubercles seem never to be developed. Tubercles and pores are of but rare occurrence in the species which I refer to *Barbus*, in other genera every species appears to be provided with them. Thus, in using this synopsis *in the determination* of species, it must be borne in mind that in every species usually provided with tubercles specimens do occur without them.

B. Scales of moderate size or large, forty or less in the lateral line. More than three and a half longitudinal series between the lateral line and the origin of the dorsal fin.
  1. Snout with pores or tubercles.
    a. Asiatic, p. 97.
    b. African, p. 98.
  2. Snout without pores or tubercles.
    a. African, p. 98.
    b. West Asiatic, p. 109.
    c. Indian.
      aa. The third dorsal ray is strong and serrated, p. 110.
      bb. The third dorsal ray is strong, but smooth, p. 126.
      cc. The third dorsal ray is not enlarged, p. 128.

C. Scales large; three and a half longitudinal series between the lateral line and the origin of the dorsal fin.
  1. Indian.
    a. The third dorsal ray is enlarged and smooth, p. 129.
    b. No osseous dorsal ray, p. 133.
  2. African, p. 134.

II. Normally two barbels.
  A. L. lat. 48–55. Eastern Asia, p. 135.
  B. L. lat 34–40. India and East Asiatic Islands.
    1. No osseous dorsal ray. India and East Asiatic Islands, p. 136.
    2. An osseous dorsal ray; barbels simple. East-Indian archipelago, p. 137.
    3. Barbels fringed. East-Indian archipelago, p. 138.

  C. L. lat. 32 or less.
    1. Snout without tubercles.
      a. Mouth extending beyond the vertical from the front margin of the orbit. East-Indian archipelago (*Hampala*), p. 139.
      b. Mouth narrow.
        α. Asiatic.
          aa. The third dorsal ray is osseous and serrated, p. 140
          bb. The third dorsal ray is osseous and smooth, p. 141.
          cc. No osseous dorsal ray, p. 146.
        β. African, p. 148.
    2. Snout with tubercles. Africa (*Varicorhinus*) p. 148.

III. Barbels none. East Indies.
  A. L. lat. 34–35. East-Indian archipelago (with Siam), p. 149.
  B. L. lat. less than 30. East-Indian continent (with Ceylon), p. 151.

I. *Normally four barbels.*

A. *Scales small or of moderate size, more than forty in the lateral line.*

1. *None of the anal rays prolonged beyond the margin of the fin. Snout without tubercles or pores.*

a. *The third dorsal ray is osseous and serrated.*

1. Barbus subquincunciatus.

D. 11. A. 8. L. lat. 82. L. transv. 17/17.

The third dorsal spine is exceedingly strong, not much shorter than the head, and finely serrated behind. There are ten longitudinal series of scales between the lateral line and the ventral fin. Body rather elongate, its depth being nearly equal to the length of the head, which is one-fifth of the total (without caudal). Snout produced, the eye occupying the middle of the length of the head. Lips? Anal fin twice as high as long; caudal deeply forked. Back and sides with series of black spots, each as large as, or half as large as, the eye, the spots being irregularly quincuncially arranged.

Habitat ——?

a. Skin, 15 inches long. From the Collection of the East-India Company.—Although no record of the history of this specimen has been preserved, it is probable that it came from Mesopotamia, as other examples from this country are preserved in precisely the same manner.

2. Barbus esocinus.

Luciobarbus esocinus, *Heckel, in Russegger's Reisen*, i. p. 1054, taf. 4. fig. 2.

D. 3/8. A. 3/5. L. lat. 76–78. L. transv. 12/7+x.

Third dorsal spine strong, serrated. There are seven longitudinal series of scales between the lateral line and the base of the ventral. Body rather compressed. Snout produced, subconical, with the jaws nearly of equal length, the mouth being anterior; lips but little fleshy. Eyes very small. Anal fin twice as high as broad; caudal deeply forked. Back with numerous scattered black dots. (*Heck.*)

River Tigris, near Mossul. Attains to a weight of 300 pounds.

3. Barbus xanthopterus.

Luciobarbus xanthopterus, *Heckel, in Russegger's Reisen*, i. p. 1053, taf. 4. fig. 1.

D. 3/8. A. 3/5. L. lat. 60. L. transv. 10/7+x.

Third dorsal spine exceedingly strong, strongly serrated, its length being two-thirds of the height of the body. There are seven longitudinal series of scales between the lateral line and the base of the ventral. Body rather compressed and somewhat elevated below the dorsal. Snout produced, conical, with the mouth inferior, and with the lips rather thin. Eyes small. Anal fin at least twice as high as broad; caudal deeply forked. Body immaculate. (*Heck.*)

River Tigris, near Mossul.

4. Barbus scheich.

Luciobarbus schejch, *Heckel, in Russegger's Reisen,* i. p. 1055, and ii. part 3. p. 215, taf. 15. fig. 1.

D. 3/8. A. 3/5. L. lat. 59–60. L. transv. 10/7+x.

Third dorsal spine exceedingly strong, strongly serrated, its length being not much less than the height of the body. There are seven longitudinal series of scales between the lateral line and the base of the ventral. Body rather elongate, the part of the back below the dorsal fin being compressed and somewhat elevated. Snout not produced; mouth inferior, lips thick (the transverse fold of the lower interrupted in the middle). Eyes rather small. The length of the base of the anal is contained more than twice in that of the anterior rays*. Caudal fin deeply forked. Coloration uniform. (*Heck.*)

River Tigris, near Mossul.

The fish described by Heckel as *Luciobarbus mystaceus* (*l. c.* p. 1051, pl. 3. fig. 3) is probably not the same species as *Cyprinus mystaceus* of Pallas (see p. 82). The specimens are from the Tigris, and evidently most closely allied to *L. scheich*, from which they appear to differ in having the lower lip developed into a short lobe. However, I direct attention to the fact that in *B. bynni* the development of this lobe is subject to great variation; and I have no doubt that Heckel would have described the specimens of this species under different names if he had seen them.

5. Barbus barbulus.

Heckel, l. c. ii. 3. p. 256.

D. 11. A. 8. L. lat. 52–54. L. transv. 10/7+x.

Third dorsal spine strong, serrated, of moderate length; the dorsal fin, if laid backwards, extends scarcely to the origin of the anal. There are seven longitudinal series of scales between the lateral line and the base of the ventral. Body rather elongate. Mouth inferior; lower lip very broad, with a very short lobule at the symphysis. (*Heck.*)

River Kara-Agatsch (Persia); River Kueik, near Aleppo.

6. Barbus kersin.

Heckel, in Russegger's Reisen, i. p. 1049, and ii. part 3. p. 211, taf. 14. fig. 2.

D. 3/8. A. 3/5. L. lat. 55–56. L. transv. 10/7+x.

Third dorsal spine very strong, coarsely serrated. There are seven longitudinal series of scales between the lateral line and the base of the ventral. Body rather compressed and elevated; snout obtuse; mouth subinferior, lips moderately thick, the transverse fold of the lower interrupted in the middle. Eyes of moderate size. Anal fin twice as high as long; caudal deeply forked. Body immaculate. (*Heck.*)

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* According to the description, not figure.

Aleppo.

7. Barbus rajanorum.

Heckel, in Russegger's Reisen, i. p. 1049, and ii. part 3. p. 209, taf. 14. fig. 1.

D. 3/8. A. 3/5. L. lat. 65. L. transv. 13/7 + *x*.

Third dorsal spine very strong, finely serrated. There are eight longitudinal series of scales between the lateral line and the base of the ventral. Body slender; snout moderately produced; mouth inferior, lips thick. Eyes small. Anal fin twice as high as long. (*Heck.*)

Aleppo.

8. Barbus plebejus.

Barbus plebejus, *Valenc. in. Cuv. Règne Anim. Ill. Poiss.* pl. 27; *Bonap. Faun. Ital. Pesc.*; *Cuv. & Val.* xvi. p. 139, pl. 462 (fig. mediocr.); *Heckel & Kner, Süsswasserf.* p. 82; *Canestrini, Arch. per la Zool.* iii. p. 110, and iv. p. 72.

Barbus eques, *Heckel & Kner, Süsswasserf.* p. 84 (an = B. eques, *Cuv. & Val.*?)

D. 3/8. A. 3/5. V. 9. L. lat. 66–75. L. transv. $\frac{14\text{-}17}{14}$. Vert. 45.

Third dorsal spine moderately strong, finely serrated. There are eight or nine longitudinal series of scales between the lateral line and the base of the ventral. Body moderately elongate; snout moderately produced. Anal fin twice as high as long.

Italy and Dalmatia.

a. Adult: skin. Lago Maggiore. Presented by T. C. Eyton, Esq.

Canestrini (Arch. per la Zool. iv. p. 30) maintains that *Barbus eques*, Cuv. & Val. xvi. p. 141, pl. 463, and Bonap. Faun. Ital. Pesc., = *Barbus fluviatilis tyberinus*, Bonap. *l. c.*, is identical with *B. plebejus* of the same authors. However, the original descriptions of *B. eques* agree in the number of scales of the lateral line, which is 60–65, whilst Canestrini himself gives as *specific* character of *B. plebejus*, L. lat. 66–75. Therefore we hesitate for the present to unite these fishes with *B. plebejus*. The *B. eques* mentioned by Heckel & Kner is evidently identical with *B. plebejus*.

Whether *Barbus fucini*, Costa, Faun. Nap. Pesc. p. 5, tab. 11, be identical with *B. plebejus* or *B. eques* (C. & V.) cannot be decided, as neither the description nor the figure are sufficiently exact.

9. Barbus vulgaris.

The Barbel. Der Barbe. Le Barbeau.

Barbus, *Auson.* vers. 94; *Rondel.* ii. p. 194; *P. Jov. Pisc. Rom.* p. 79; *Salvian.* p. 86, fig. 19; *Gesner, Aquat.* iv. p. 124; *Aldrovand.*

p. 598; *Willughby*, p. 259, tab. Q 2. fig. 1; *Ray, Synops.* p. 121; *Marsil. Danub.* iv. p. 18, tab. 7. fig. 1; *Schonev.* p. 29.

Mystus, Fluviatilis Barbus, *Bellon.* i. p. 301; *Klein, Pisc. Miss.* v. p. 64. sp. 1.

Cyprinus, *Artedi, Genera*, p. 4. no. 11, and *Synon.* p. 8. no. 14; *Gronov. Zoophyl.* i. p. 104, and *Mus. Ichthyol.* i. p. 5, and ii. p. 3. no. 20.

Cyprinus barbus, *L. Syst. Nat.* i. p. 527; *Bloch, Fische Deutschl.* i. p. 109, taf. 18; *Bl. Schn.* p. 450; *Lacép.* v. p. 524; *Pallas, Zoogr. Ross.-As.* iii. p. 291; *Meidinger, Ic.* tab. 9; *Turton, Brit. Faun.* p. 107; *Donovan, Brit. Fish.* ii. pl. 29; *Jenyns, Man.* p. 404; *Gronov. Syst.* ed. *Gray*, p. 177.

Barbeau, *Duhamel, Pesches*, ii. p. 520.

Barbel, *Pennant, Brit. Zool.* iii. p. 312, and edit. 1812, iii. p. 472, pl. 82; *Yarrell, Brit. Fish.* i. p. 321, and 2nd edit. i. p. 367, and 3rd edit. i. p. 378; *Couch, Brit. Fish.* iv. p. 16, pl. 181.

Barbus vulgaris, *Fleming, Brit. An.* p. 185.

Barbus fluviatilis, *Agassiz, Mém. Soc. Sc. Nat. Neuchatel*, i. p. 37; *Cuv. & Val.* xvi. p. 125; *Sélys-Longchamps, Faun. Belge*, p. 194; *Kröyer, Danm. Fisk.* iii. p. 321; *Günther, Fische d. Neck.* p. 40; *Rapp, Fische d. Bodens*, p. 5; *Heckel & Kner, Süsswasserf.* p. 79; *Kessler, Bull. Soc. Nat. Mosc.* 1859, xxxii. pt. 1. p. 527; *Siebold, Süsswasserf.* p. 109; *Canestrini, Arch. per la Zoolog.* iv. 1866, p. 79; *Jeitteles, Fische d. March*, p. 27, and *Verhandl. zool.-bot. Gesellsch. Wien*, 1862, p. 296; *Blanchard, Poiss. France*, p. 302 (fig. very bad).

—— cyclolepis, *Heckel, Ann. Wien. Mus.* ii. p. 155.

—— communis, *Nordmann, in Demid. Voy. Russ. Mérid.* iii. p. 172.

D. 3/8–9. A. 3/5. V. 9–10. L. lat. 55–62. L. transv. $\frac{11\text{-}12}{14\text{-}15}$.
Vert. 26/21.

Osseous dorsal ray strong and strongly serrated, not flexible. There are seven longitudinal series of scales between the lateral line and the base of the ventral. The length of the head is one-fourth of the total (without caudal). Body elongate; snout much produced, with thick lips. Eyes small. Anal fin at least twice as high as broad; caudal deeply emarginate.

Northern and Central Europe. Tributaries of the Isonzo.

a. Thirty inches long. Serpentine. Presented by Mr. Slark.
b. Adult: stuffed. Thames. Presented by Sir J. Banks, Bart.
c. Adult: skin. Thames. From Yarrell's Collection.
d. Half-grown. London. Presented by Mr. Yarrell.
e–h. Adult: skins. England.
i, k. Half-grown. Holland.
l. Half-grown: skin. Holland. From Gronow's Collection.
m–n. Half-grown. River Amper (Bavaria). From Dr. Gemminger's Collection.
o–q. Young. River Würm (Bavaria). From Dr. Gemminger's Collection.
r. Adult: stuffed. Mauritius (acclimatized). From M. Telfair's Collection.
s. Adult: skeleton. Neckar. From Dr. A. Günther's Collection.
t. Adult: skull. Rhine. From Dr. A. Günther's Collection.

Barbus mayori, Cuv. & Val. xvi. p. 138, pl. 461 (bad), is a very doubtful species. Valenciennes characterizes it thus:—

D. 4/8. A. 3/5. L. lat. 70.

Third dorsal spine very strong and strongly serrated, not flexible. Body elongate; snout much produced, with thick lips. Eyes small. Anal fin two-thirds as broad as high.

It was established upon a single example from the Lake of Zug; and its chief difference from the Common Barbel appears to be the greater width and less depth of the anal fin; however, the drawing quoted represents this fin of exactly the same shape as that of the Common Barbel. Steindachner, who examined four examples from the same locality (Verh. zool.-bot. Ges. Wien, 1866, p. 385), says that they are identical with *B. fluviatilis*. But Valenciennes gives the number of scales of the lateral line as 70; so that it will be necessary to reexamine the typical specimen of *B. mayori* in the Paris Museum before it is reunited with the common species.

10. Barbus lacerta.

Heckel, in Russegger's Reisen, i. p. 1044, *Fische*, taf. 2. fig. 1.

Very closely allied to *B. fluviatilis*, but with the caudal fin less deeply notched.

D. 3/8. A. 3/5. L. lat. 60–62. L. transv. 12/7 + x

Third dorsal spine moderately strong, serrated. There are seven longitudinal series of scales between the lateral line and the base of the ventral. Body rather elongate; snout much produced, with thick lips. Eyes rather small. The length of the head is one-fourth of the total (to the end of the middle caudal rays). Anal fin twice as high as broad; caudal moderately notched. (*Heck.*)

River Kueik. near Aleppo.

11. Barbus scincus.

Heckel, in Russegger's Reisen, i. p. 1049, and ii. part 3. p. 212, taf. 14. fig. 3.

D. 3/8. A. 3/5. L. lat. 55–56. L. transv. 10/7 + x.

Third dorsal spine rather feeble, finely serrated. There are seven longitudinal series of scales between the lateral line and the base of the ventral. Body elongate, subcylindrical; snout moderately produced, with the upper profile convex; mouth inferior; lips thick. Eyes small. The length of the head is two-ninths of the total (without caudal). Anal fin two-thirds as broad as high; caudal moderately notched. Body with dark clouded spots. (*Heck.*)

River Kueik, near Aleppo.

12. Barbus longiceps.

Cuv. & Val. xvi. p. 179, pl. 467 (very bad).

Most closely allied to *B. fluviatilis*, but with the snout and head more elongate.

D. 11. A. 8. L. lat. 54–55. L. transv. 11/13. Vert. 25/19.

Osseous dorsal ray strong, conspicuously serrated *. There are eight longitudinal series of scales between the lateral line and the base of the ventral. The length of the head is one-third of the total (without caudal), and in young examples always more than one-fourth. Body rather elongate; snout very long and pointed; lips thick, the lower with the fold interrupted in the middle. Eyes small. Anal fin narrow and deep; caudal deeply forked.

Palestine.

a–e. Adult and half-grown, 11–19 inches long. Lake of Galilee. From the Collection of the Rev. H. B. Tristram.

f. Adult female: skeleton. Lake of Galilee. From the Collection of the Rev. H. B. Tristram.

Although the *skeleton* is very similar to that of *B. fluviatilis*, it differs, beside the smaller number of vertebræ, in the following points:—

1. The foremost tooth of the inner pharyngeal series is exceedingly large, thrice the size of the succeeding tooth, very obtuse, somewhat molar-like; the other teeth are comparatively short, with an oblique masticatory surface, and without distinct hook. This difference in two species so closely allied as *B. fluviatilis* and *B. longiceps*, shows that the structure of the pharyngeal teeth is by no means of so great a value as a generic character as some ichthyologists believe.

2. There is an oval discontinuity of the osseous substance between ulna and radius, which is entirely filled up in *B. fluviatilis*.

3. The interneural and interhæmal spines are comparatively narrower and more feeble.

13. Barbus chalybeatus.

Cyprinus bulatmai, *Gmelin, Reise*, iv. p. 135; *L. Gm.* iii. p. 1414.
—— chalybatus, *Pallas, Zoogr. Ross.-As.* iii. p. 292.
Barbus chalybatus, *Nordmann, in Demid. Voy. Rus. Mérid.* iii. p. 474.

This Barbel is very imperfectly known. It has a strong serrated dorsal ray. It is described as "macrolepidotus; caput productum, maxilla superiore productiore, conica, labiis carnosis productilibus." Ten series of scales above, and eight below the lateral line. Body and fins marbled and spotted with black.

Caspian Sea and rivers between the Caspian and Black Seas.

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* Prof. A. Duméril has, at my request, examined the typical specimen and kindly informed me that it has really the dorsal ray serrated.

14. Barbus bocagii.

Steindachner, Catal. prélim. Poiss. d'eau douce de Portugal (*Mém. Acad. Sc. Lisbon.* 1866), p. 3, and *Sitzgsber. Ak. Wiss. Wien,* 1866, liv. p. 7, taf. 1.

D. 3/8. A. 3/5. L. lat. 47–52. L. transv. 9/9.

Third dorsal spine rather feeble, finely serrated. There are five longitudinal series of scales between the lateral line and the base of the ventral. Body moderately elongate; snout much produced, with thick lips. Eyes small. Anal fin at least twice as high as broad. Coloration uniform; young specimens irregularly marbled and spotted with brown.

Pyrenean peninsula.

a–e. Adult, half-grown, and young. Coimbra (River Mondego). Presented by Dr. Barb. du Bocage.

The author quoted believes he has found *hybrids* between this species and *Chondrostoma polylepis*, which have all the other characters of the Barbel, but the jaws and mouth of *Chondrostoma*. This observation requires to be confirmed; such a combination of characters is found in Cyprinoid genera of Western Asia, which are certainly not hybrids.

15. Barbus callensis.

? Barbus leptopogon (*Agassiz, Prodrom.*), *Bonap. Faun. Ital. Pesc.*, figure without description.
? Barbus callensis, *Cuv. & Val.* xvi. p. 147.

D. 3/8–9. A. 3/5. L. lat. 48–50. L. transv. 9/11.

Third dorsal spine very strong, strongly serrated. There are six longitudinal series of scales between the lateral line and the base of the ventral. Body oblong, rather compressed; snout not produced, with the cleft of the mouth subterminal and of moderate width; lips thin. Eye of moderate size. Anal fin at least twice as high as broad.

Spain (River Tajo); Algeria.

a–b. Half-grown and young. Algiers. Purchased of M. Parzudaki as *B. callensis*.

I have not been able to find the original notice of Agassiz's *B. leptopogon*, which, however, according to Valenciennes, appears to be but short and insufficient. Bonaparte does not state whether the figure published by him in the 'Fauna Italica' is taken from the typical specimen or from an example in some other collection. That figure agrees with the description given by Valenciennes of *B. callensis* in representing the scales larger than those found in the other species of this division of the genus, the lateral line being composed of about forty scales. However, the Algerian specimens in the British Museum, received with the name of *B. callensis*, have forty-eight scales; and a reexamination of the examples in the Paris Museum may show that *B. callensis* really has this number of scales.

Barbus pectoralis, Heckel, in Russegger, Reisen, i. p. 1045, taf. 2. fig. 2, from the Orontes, seems scarcely different from the above species. (L. lat. 44.)

16. Barbus comiza.

Barbus comizo, *Steindachner*, *Catal. prélim. Poiss. d'eau douce de Portugal* (*Mém. Acad. Sc. Lisbonne*, 1866), p. 4.
—— comiza, *Steindachner*, *Sitzgsber. Ak. Wiss. Wien*, 1866, liv. p. 8, taf. 2.

D. $\frac{3}{8-9}$. A. 3/5. L. lat. 49–51. L. transv. 9/?.

Third dorsal spine very strong, strongly serrated. There are six longitudinal series of scales between the lateral line and the base of the ventral. Body compressed, moderately elongate; snout much produced and narrow, with the cleft of the mouth somewhat bent upwards and terminal; lips and barbels very thin. Eyes of moderate size. Anal narrow and high; caudal deeply forked. (*Steind.*)
Rivers Tagus and Guadiana.

The author quoted mentions also (*ibid.*) a hybrid between this species and *Chondrostoma willkommii*. See on this point *Barbus bocagii*, p. 92.

17. Barbus perniciosus.

Heckel, in Russegger's Reisen, i. p. 1047, taf. 2. fig. 3.

D. 3/8. A. 8. L. lat. 42. L. transv. 8.

Third dorsal spine exceedingly strong, higher than the body, strongly serrated. There are six longitudinal series of scales between the lateral line and the base of the ventral. Body elongate, head depressed; snout of moderate extent; lips thin. Eyes large, two-sevenths of the length of the head. Anal fin narrow, deep; caudal deeply forked. (*Heck.*)
Damascus.

18. Barbus sclateri.

D. 11. A. 8–9. L. lat. 45–46. L. transv. 8/8.

The osseous dorsal ray is very strong, strongly serrated, its osseous portion being as long as the head, without snout. The height of the body (which is rather compressed) is nearly equal to the length of the head, and about one-fourth of the total (without caudal). Head rather depressed, flat above; snout produced, somewhat pointed; mouth inferior; lips thick; barbels rather long, the upper reaching somewhat beyond the front margin of the orbit, the lower to the angle of the præoperculum. The eye is a little nearer to the end of the snout than to that of the præoperculum, its diameter being two-fifths of the length of the snout, and one-sixth of that of the head in adult examples. There are four or five longitudinal series of scales between the lateral line and the ventral fin. The origin of the dorsal fin is in the middle of the total length (without caudal). Anal very narrow and pointed, the length of its base being at least two-fifths of its height; it does not reach the caudal when laid backwards. Caudal as long as the head, deeply forked, with the lobes pointed, the length of the middle rays being one-third of that of the outer ones. Pectoral rather long, extending to the twelfth scale of the lateral line. The ventral is inserted immediately behind the vertical from the dorsal spine, and somewhat shorter than the pectoral. Scales with numerous radiating striæ. Uniform greenish, shining silvery, with a darker stripe along each series of scales. Dorsal and caudal blackish.

Guadalquivir.

a–e. From 7 to 12 inches long. Presented by Dr. P. L. Sclater.
f. Half-grown: stuffed. Portugal. Purchased of Mr. Flower.

19. **Barbus serra.**

Peters, Monatsber. Ak. Wiss. Berlin, 1864, p. 394.

D. 12. A. 8. L. lat. 44. L. transv. 6–7/?.

Osseous dorsal ray very strong, strongly serrated. There are five longitudinal series of scales between the lateral line and the ventral fin. The height of the body is contained five times and one-third in the total length (without caudal), the length of the head thrice and one-half. The eye is a little nearer to the end of the snout than to that of the præoperculum, its diameter being one-half of the length of the snout, and rather less than one-fifth of that of the head. The dorsal fin occupies the middle between the base of the caudal and the middle of the opercle, and commences immediately behind the insertion of the ventrals. (*Pet.*)

Cape of Good Hope.

b. *The third dorsal ray is not enlarged.*

20. **Barbus graëllsii.**

Steindachner, Sitzgsber. Akad. Wiss. Wien, 1866, liii. p. 198, liv. taf. 3. fig. 1 (incorrect).

Scarcely distinct from *B. caninus.*

D. 3/8. A. 3/5. L. lat. 48–50. L. transv. $\frac{8-9}{(5^*)}$.

Third dorsal spine not stronger than the other rays, flexible, and not serrated. There are five (?) longitudinal series of scales between the lateral line and the base of the ventral. Body rather elongate; snout moderately produced, with thick lips; barbels somewhat elongate. Eyes small. The orgin of the dorsal fin is midway between the front margin of the orbit and the root of the middle caudal rays †. Anal fin narrow and high; caudal deeply forked, the length of the middle rays being less than one-half of that of the outer ones. (*Steind.*)

Ebro.

The author quoted mentions (*ibid.*) a fish which he regards as a hybrid between this species and *Chondrostoma miegii*. See a note on this point on *Barbus bocagii*, p. 92.

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* 7 according to figure.

† According to the description; but in the figure it is midway between root of the caudal and end of the snout, as in *B. caninus.*

21. Barbus caninus.

? Barbus meridionalis, *Risso, Ichth. Nice*, p. 437.
Barbus caninus, *Cuv. Règne An.*; *Bonap. Faun. Ital. Pesc.*; *Cuv. & Val.* xvi. p. 142, pl. 464; *Heckel & Kner, Süsswasserfische*, p. 85; *Canestrini, Arch. per la Zool.* iv. 1866, p. 77; *Steindachner, Sitzgsber. Ak. Wiss. Wien*, 1866, liii. p. 205.
—— guiraonis, *Steindachner, l. c.* liv. p. 11, taf. 5.
—— meridionalis, *Blanchard, Poiss. France*, p. 313.

D. 3/7–8. A. 3/5. V. 9. L. lat. 48–52. L. transv. 10/13.

Osseous dorsal ray not stronger than the others, flexible and not serrated. There are six longitudinal series of scales between the lateral line and the base of the ventral. Body moderately elongate; snout moderately produced, with thick lips. Eyes small. The origin of the dorsal fin is midway between the front margin of the orbit and the root of the middle caudal rays. Anal fin at least twice as high as broad. Caudal fin moderately forked, the middle rays being half as long as the outer longest. Body and vertical fins with black dots.

Northern parts of Italy to the Pyrenees, and eastern parts of the Pyrenean peninsula.

a–c, d–f. Adult females and half-grown. River Var, near Nice. From Dr. Deakin's Collection.
g. Young: stuffed. From Yarrell's Collection.

22. Barbus petenyi.

Semling.
Leonhard, *Lehrbuch zur Beförderung der Kenntniss von Siebenbürgen, Hermannstadt*, 1818, p. 191.
Barbus petenyi, *Heckel, in Haidinger, Berichte über d. Mittheilungen von Freund. d. Ntrwiss. Wien*, iii. 1848, p. 194, and *Verhandl. zool.-bot. Gesellsch. Wien*, 1853, p. 29; *Heckel & Kner, Süsswasserf.* p. 78; *Siebold, Süsswasserf.* p. 111; *Jeitteles, Verhandl. zool.-bot. Gesellsch. Wien*, 1862, p. 298.
Pseudobarbus leonhardi, *Bielz, Verhandl. & Mittheil. d. Siebenbürg. Vereins f. Ntrwiss. zu Hermannstadt*, iv. 1853, pp. 173, 179, taf. 3. fig 1, and *Fauna d. Wirbelth. Siebenbürg. Hermannst.* 1856, p. 173.

D. 3/8. A. 3/5. L. lat. 55–60. L. transv. $\frac{11-12}{8-9}$.

Third dorsal spine not stronger than the other rays, flexible, and not serrated. Body rather elongate; snout rather produced, with moderately thick lips. Eyes small. Anal fin nearly thrice as high as broad. Body and tail irregularly marbled with blackish brown.

Transylvania and Hungary.

Jeitteles (*l. c.*) says that he generally found 53–55 scales in the lateral line, and that this fish may eventually prove to be identical with *B. caninus*.

23. Barbus burchelli.

Barbus (Pseudobarbus) burchelli, *Smith, Ill. Zool. S. Afr. Pisc.* pl. 11. fig. 1.

L. lat. ca 47. L. transv. $\frac{4\,(?)}{7\,(?)}$.

Dorsal fin without osseous ray. There appear to be five longitudinal series of scales between the lateral line and the root of the ventral. Snout short, not much longer than the eye; lips thin. The height of the body is somewhat more than the length of the head, which is one-fourth of the total (without caudal); the depth of the head equals its length, without snout. The origin of the dorsal is above that of the ventral, and midway between the end of the snout and the root of the caudal. Caudal fin forked. (*Smith.*)

Cape Colony. Of small size.

2. *Snout with tubercles or pores; third dorsal ray serrated.*

24. Barbus spilopholis.

Barbus spilopholus, *M'Clell. Ind. Cypr.* pp. 272, 341, pl. 39. fig. 4.

D. 11. A. 7. L. lat. 46. L. transv. 11/9.

The two last anal rays are prolonged far beyond the margin of the fin in certain specimens. Osseous dorsal ray very strong, coarsely serrated. There are five longitudinal series of scales between the lateral line and the ventral fin. The height of the body is two-sevenths of the total length (without caudal), the length of the head one-fourth. The eye occupies the middle of the length of the head, and is immediately below the upper profile. Interorbital space flat; præorbital region high, covered with tubercles. Upper barbel small. Dorsal fin commences midway between the end of the snout and the root of the caudal. Base of each scale with a black dot.

Northern Bengal.

a. Nine and a half inches long: stuffed. Gong River. From M'Clelland's Collection.

b–c. Adult: skins. Gong River. From M'Clelland's Collection.

25. Barbus beavani.

D. 11. A. 8. L. lat. 47. L. transv. 11/11.

None of the anal rays are prolonged. Osseous dorsal ray very strong, not quite as long as the head, coarsely serrated. There are six longitudinal series of scales between the lateral line and the ventral fin. The height of the body is contained thrice and one-third in the total length (without caudal), the length of the head four times. The eye is before the middle of the length of the head, and immediately below the upper profile. Interorbital space flat; præorbital region high, covered with small grooves. Barbels subequal in length, rather longer than the eye. Dorsal fin commences midway between the end of the snout and the root of the caudal. Mouth inferior, horseshoe-shaped; fold of the lower lip not extending across the symphysis. Uniform silvery.

Cossye River.

a–b. Adult (145 millim.) and young. Presented by Lieut. R. C. Beavan

26. Barbus clavatus.

? Cyprinus chagunio, *Ham. Buch. Fish. Ganges*, p. 295.
Barbus clavatus, *M'Clell. Calcutta Journ. Nat. Hist.* v. 1845, p. 280, pl. 21. fig. 2.

D. 11. A. 8. L. lat. 42.

The osseous dorsal ray is strong, serrated behind, as high as the body. There are eleven and a half scales in an oblique row from the base of the ventrals to the dorsal. The height of the body is more than the length of the head, and contained thrice and three-fourths in the total (without caudal). Snout covered with small, thorny tubercles. Barbels well developed, equal in length. Eyes midway between snout and operculum. None of the anal rays prolonged. Coloration uniform. (*M'Cl.*)

Sikkim.

B. *Scales of moderate size or large, forty or less in the lateral line. More than three and a half longitudinal series between the lateral line and the origin of the dorsal fin.*

1. *Snout with pores or tubercles.*

a. *Asiatic.*

27. Barbus paradoxus.

D. 11. A. 8. L. lat. 40. L. transv. 6/6.

The long simple dorsal ray is scarcely stronger than the others, and not serrated. The height of the body is contained thrice and two-thirds or thrice and three-fourths in the total length (without caudal), the length of the head four times or four times and a half. Head rather compressed; interorbital space convex, its width being much more than the diameter of the eye, which is contained from four times and a half to five times and a half in the length of the head. Snout variable in length; mouth inferior, horseshoe-shaped, with thick lips; barbels well developed, the lower being longer than the upper and than the eye. The eye is situated before the middle of the length of the head. There are three and a half longitudinal series of scales between the lateral line and the root of the ventral fin. The origin of the dorsal fin is a little nearer to the root of the caudal than to the end of the snout, and a little in advance of the ventral. Anal narrow, twice as high as long, nearly reaching the caudal when laid backwards. Caudal fin a little longer than the head, deeply forked, the length of the middle rays being two-fifths of that of the outer longest. The pectoral extends to the tenth scale of the lateral line, and is somewhat longer than the ventral. Greyish green, each scale with darker margin; fins black towards the edge.

This species offers a very singular variation of the form of the snout. The four specimens examined are females with the ova in the same advanced state of development, and 8 and 8½ inches long. However, one has the snout considerably produced, its extent being scarcely less than the length of the postorbital portion of the head; the lips are extremely thick, and the lower separated by a deep fissure into two lobe-like lateral halves; the skin of the præorbital is provided with several series of small, round, shallow grooves or pores. In the other specimens the snout is obtuse, much shorter than the postorbital portion of the head; the lips are much less thick, the fold of the lower being broadly interrupted in the middle. The præorbital grooves are as much developed as in the first specimen, or merely indicated, or entirely absent. It appears that this peculiar difference can be accounted for only by a different age of the individuals.

Pharyngeal teeth 5 . 3 . 2—2 . 3 . 5, subconical, subuncinate.

a–d. Females, 8–8½ inches long. Formosa. From Consul R. Swinhoe's Collection.

b. *Africa.*

28. **Barbus quadrimaculatus.**

Gobio quadrimaculatus, *Rüppell, Mus. Senckenb.* ii. 1837, p. 22, taf. 3. fig. 3.
—— hirticeps, *Rüppell, l. c.* p. 23. fig. 4 (male).

D. 9. A. 7. L. lat. 35–37. L. transv. 10.

Dorsal fin without osseous ray. Male (?) with the snout covered with warts; mouth inferior. Body not compressed, moderately elongate. The origin of the dorsal fin is in advance of that of the ventrals, and midway between the end of the snout and the root of the caudal. Caudal emarginate. A blackish spot on the middle of the dorsal fin, sometimes another in the scapulary region, and a third in the middle of the root of the caudal. (*Rüpp.*)

Rivers and rivulets of Abyssinia.

Heckel is inclined to refer this species to *Discognathus* (Russegger's Reisen, i. p. 1074); on another occasion (*l. c.* p. 1027) he refers it to *Tylognathus.*

2. *Snout without pores or tubercles.*

a. *African.*

29. **Barbus capensis.**

Barbus (Cheilobarbus) capensis, *Smith, Ill. Zool. S. Africa, Pisces,* pl. 10. fig. 1 (scales too small).

D. 11. A. 8. L. lat. 40. L. transv. 6/6.

Dorsal fin without strong osseous ray. There are three and a half longitudinal series of scales between the lateral line and the base of the ventral. Body rather elongate; snout much produced, pointed, with rather thin lips. Eyes small. The origin of the dorsal fin is a little nearer to the root of the caudal than to the end of the snout. Caudal fin deeply forked.

Breede and Oliphant Rivers.

a. Type of the species, 17 inches long: stuffed. Presented by Sir A. Smith.

30. Barbus setivimensis.

Cuv. & Val. xvi. p. 149.

D. 3/8. A. 3/5. L. lat. 40.

The third dorsal ray is very slender and denticulated. Body moderately long. Caudal fin but little forked. (*Val.*)

Setif (Algeria).

31. Barbus affinis.

Rüppell, Mus. Senckenb. ii. 1837, p. 8, tab. 1. fig. 3.

D. 11. A. 8. L. lat. 36. L. transv. 5/4.

The osseous dorsal ray is strong, smooth, its stiff portion being somewhat more than half as long as the head. There are three series of scales between the lateral line and the root of the ventral fin. Lips without lobes. The height of the body is one-fourth of the total length (without caudal), the length of the head two-ninths. Head longish, snout rather produced. The origin of the dorsal fin is somewhat behind* the vertical from the root of the ventrals, and midway between the end of the snout and base of the caudal. Caudal deeply forked. Pectoral as long as the head, terminating, in adult examples, at a distance from the ventrals inferior to its own length. (*Rüpp.*)

Lake Zana.

32. Barbus surkis.

Rüppell, Mus. Senckenb. ii. 1837, p. 5, taf. 1. fig. 1.

D. 11. A. 8. L. lat. 36. L. transv. 5/5.

The osseous dorsal ray is strong, smooth, its stiff portion being only about two-thirds as long as the head. There are four series of scales between the lateral line and the root of the ventral fin. Lips without lobes. The height of the body is contained twice and three-fourths in the total length (without caudal), the length of the head four times and a half. Head somewhat depressed, small; snout of moderate length. The origin of the dorsal fin is somewhat before the vertical from the root of the ventrals, and rather nearer to the end of the snout than to the root of the caudal. Caudal forked. (*Rüpp.*)

Lake Zana.

33. Barbus elongatus.

Rüppell, Mus. Senckenb. ii. 1237, p. 11, taf. 2. fig. 1.

D. 12. A. 8. L. lat. 36. L. transv. 10.

The osseous dorsal ray is of moderate strength, smooth, its stiff portion being scarcely half as long as the head. There are two and a half (?) series of scales between the lateral line and the root of the ventral fin. Lips without lobes; mouth anterior. The height of the body is two-ninths of the total length (without caudal), the length of the head one-fourth. Head elongate, snout produced. The origin of the dorsal fin is before the vertical from the base of the ventrals, and nearer to the end of the snout than to the base of the caudal. Caudal fin forked. (*Rüpp.*)

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* Before, according to the figure.

Lake Zana.

34. Barbus intermedius.

Rüppell, Mus. Senckenb. ii. 1837, p. 7, taf. 1. fig. 2.

D. 12. A. 8. L. lat. 32. L. transv. 5/4.

The osseous dorsal ray is strong, smooth, its stiff portion being about three-fourths as long as the head. There are two and a half series of scales between the lateral line and the root of the ventral fin. The length of the head is two-ninths of the total (without caudal). Snout moderately produced, somewhat pointed; mouth inferior; lips not thickened, without lobes. Body moderately elongated, somewhat elevated below the origin of the dorsal, its greatest depth being two-sevenths of the total (without caudal). The origin of the dorsal fin is nearly opposite that of the ventral, and a little nearer the end of the snout than the root of the caudal. Caudal fin deeply forked. (*Rüpp.*)

Lake Zana.

35. Barbus gorguari.

Rüppell, Mus. Senckenb. ii. 1837, p. 9, taf. 1. fig. 4.

D. 12. A. 8. L. lat. 32. L transv. 10.

The osseous dorsal ray is moderately strong, smooth, its stiff portion being not quite half as long as the head. There are three (?) series of scales between the lateral line and the root of the ventral fin. The length of the head is contained thrice and one-third in the total (without caudal); snout produced, with the cleft of the mouth wide*; mouth anterior, lips without lobes. Eye small. Body elongate, its height being two-ninths of the total length (without caudal). The origin of the dorsal fin is opposite the root of the ventrals, and nearer to the root of the caudal than to the end of the snout. Caudal fin deeply forked. (*Rüpp.*)

Lake Zana.

36. Barbus marequensis.

Barbus (Cheilobarbus) marequensis, *Smith. Ill. Zool. S. Afr. Pisc.* pl. 10. fig. 2 (scales too small).

D. 11. A. 7. L. lat. 34. L. transv. 6/5.

The osseous dorsal ray is of moderate strength and smooth. There are three longitudinal series of scales between the lateral line and the base of the ventral. Body moderately elongate, its depth being a little more than the length of the head, which is one-fourth of the total (without caudal). Snout of moderate length and somewhat wedge-shaped; lips thin, the lower with the transverse fold continuous; mouth inferior. Eyes of moderate size. The origin of the dorsal fin is a little nearer to the root of the caudal than to the end of the snout. Caudal fin forked. Anal very high and narrow, extending to the root of the caudal.

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* According to the figure, the mouth appears comparatively rather narrow.

Interior of Southern Africa.

a. Type of the species, 15 inches long: stuffed. Presented by Sir A. Smith.

37. **Barbus welwitschii.**

D. 10. A. 8. L. lat. 35–36. L. transv. $6\frac{1}{2}/6$.

The osseous dorsal ray is rather strong, very conspicuously serrated, its stiff portion being two-thirds as long as the head; there are only seven other rays behind the osseous ray. Three longitudinal series of scales between the lateral line and the root of the ventral. Body oblong, its height being contained thrice and three-fourths in the total length (without caudal), the length of the head four times; *the depth of the head is less than its length, without snout.* The diameter of the eye is less than the width of the interorbital space (which is convex), rather more than one-fourth of the length of the head, and equal to that of the snout, which is moderately obtuse. Mouth inferior, small; the lower barbel is considerably longer than the upper, but scarcely as long as the eye. *The dorsal fin is considerably lower than the body, and commences behind the origin of the ventral, its first ray being equidistant from the end of the snout and the root of the caudal.* Anal fin small, caudal deeply forked. The pectoral does not quite extend to the ventral. Back brownish, sides silvery, minutely punctulated with brown. An indistinct narrow bluish band runs along the caudal portion of the lateral line.

Angola.

a–c. Three and a half inches long. Fluilla. Presented by Dr. Welwitsch.

38. **Barbus gibbosus.**

Peters, Monatsber. Ak. Wiss. Berl. 1852, p. 683.

D. 9. A. 8. L. lat. 36. L. transv. 6/4.

The osseous dorsal ray is rather strong and serrated; there are only seven other rays behind the osseous ray. Three and a half longitudinal series of scales between the lateral line and the root of the ventral. Body oblong, its height being contained thrice and three-fourths in the total length (without caudal); the length of the head is one-fourth of the same; *the depth of the head equals its length, without snout.* The diameter of the eye is one-fourth of the length of the head, and about equal to that of the snout. Mouth rather small, the lower barbel much longer than the upper, and slightly exceeding the diameter of the eye. *The height of the dorsal fin is slightly less* *than the depth of the body; its commencement is somewhat behind that of the ventral, and rather nearer to the end of the snout than to the root of the caudal.* Anal fin about two-thirds as long as high; caudal moderately forked; the pectoral extends to the root of the ventral. Coloration uniform.

Tette.

Prof. Peters has kindly communicated to me a drawing of this species, from which I have drawn up this description.

39. Barbus paludinosus.

Peters, Monatsber. Ak. Wiss. Berlin, 1852, p. 683.

D. 9. A. 8. L. lat. 34. L. transv. 7/5.

Osseous dorsal ray strong and very conspicuously serrated. Three longitudinal series of scales between the lateral line and the root of the ventral. Body oblong, its height being contained thrice and two-thirds in the total length (without caudal); the length of the head is one-fourth of the same; *the depth of the head is less than its length, without snout.* The diameter of the eye is a little less than one-fourth of the length of the head; snout scarcely obtuse, as long as, or a little shorter than, the diameter of the eye. Mouth of moderate size; lower barbel longer than the upper one, but less than the diameter of the eye. *The height of the dorsal fin is less than the depth of the body; its commencement is situated entirely behind the ventral fin, and nearer to the caudal than to the end of the snout.* Caudal moderately forked, pectoral reaching slightly beyond the root of the ventral. Coloration uniform.

Quellimane.

a–c. Three of the typical specimens. From the Berlin Museum.

40. Barbus gurneyi.

D. 12. A. 8. L. lat. 32. L. transv. $5\frac{1}{2}/4$. Vert. 25/16.

The osseous dorsal ray is not stronger than the others, flexible, without any serrature. There are two longitudinal series of scales between the lateral line and the root of the ventral. Body rather elongate, its depth being less than the length of the head, which is contained thrice and two-thirds in the total (without caudal) in adult specimens, and thrice and one-third in young ones. Head somewhat depressed, flattish above, its depth being equal to its length, without snout. *The eye is small, its diameter being one-fifth of the length of the head in specimens only $3\frac{1}{2}$ inches long.* Snout of moderate length, subconical; lips thick, the lower with a broad and very short lobe, which, in young examples, is not developed. Mouth anterior. The origin of the dorsal fin is a little in advance of that of the ventral, and somewhat nearer to the root of the caudal than to the end of the snout. Anal narrow, deep; caudal deeply forked. Coloration uniform, young examples with an indistinct dark streak along the middle of the sides.

Port Natal.

a.–g, *h–o*. Adult (9 inches long) and young. Port Natal. From Mr. Ayres's Collection.
p. Adult: skeleton. Port Natal. From Mr. Ayres's Collection.

I have named this species after J. H. Gurney, Esq., through whose mediation we have received numerous examples from Port Natal.

41. Barbus inermis.

Barbus (Dangila) inermis, *Peters, Monatsber. Ak. Wiss. Berlin*, 1852, p. 683.

D. 13. A. 8. L. lat. 31. L. transv. $4\frac{1}{2}/3$.

The osseous dorsal ray is scarcely stronger than the others, flexible, without serrature. There are two and a half longitudinal series of scales between the lateral line and the root of the ventral. Body rather elongate, its depth being less than the length of the head, which is one-fourth of the total length (without caudal). Head depressed, its depth being less than its length, without snout. *The eye is more than one-fourth of the length of the head* in specimens 3 inches long. Snout rather obtuse. Mouth small. *The origin of the dorsal fin is considerably in advance of that of the ventral*, and somewhat nearer to the end of the snout than to the root of the caudal. Anal narrow, deep; caudal deeply forked. Coloration uniform.
Tette.

This description is made from a drawing kindly communicated to me by Professor Peters.

42. Barbus unitæniatus.

Puntius vittatus, *Steindachner, Verh. zool.-bot. Ges. Wien*, 1866, p. 767, taf. 17. fig. 2. (not *Day*).
Barbus unitæniatus, *Günth. Record Zool. Lit.* iii. p. 151 (name only).

D. 11. A. 8. L. lat. 30–33. L. transv. $5\frac{1}{2}/?$.

The osseous dorsal ray is scarcely stronger than the others, flexible, without serrature. There are two and a half longitudinal series of scales between the lateral line and the root of the ventral. The length of the head is rather more than one-fourth, the depth of the body two-sevenths of the total length (without caudal). The eye is one-third, or somewhat less than one-third, of the length of the head, in specimens 3 inches long. Snout rather obtuse. Mouth small. The origin of the dorsal fin is opposite that of the ventral, and midway between the end of the snout and the root of the caudal fin. Anal small, low. Caudal moderately forked. A greyish or blackish band runs from the eye to the caudal fin. (*Steind.*)
Angola.

43. Barbus argenteus.

D. 11. A. 7. L. lat. 29–31. L. transv. $5/4\frac{1}{2}$.

The osseous dorsal ray is of moderate strength, its stiff portion being two-thirds as long as the head: its serrature is not very fine. There are two and a half longitudinal series of scales between the lateral line and the root of the ventral fin. Body compressed, oblong, its depth being two-sevenths of the total length (without caudal). The length of the head one-fourth. Snout pointed, of moderate length, longer than the diameter of the eye, which is two-ninths of the length of the head. The upper barbel is shorter than the lower, which is as long as the eye. Upper jaw overlapping the lower. Interorbital space narrow, slightly convex. The dorsal fin is considerably lower than the body; its origin is somewhat before that of the ventral, and nearer to the end of the snout than to the root of the caudal. Anal fin moderately deep, its rays not reaching by far the root of the caudal, if laid backwards. Fork of the caudal fin of moderate depth. Body uniform silvery.

Angola.

a–d. From 3 to 4½ inches long. Polungo Alto. Presented by Dr. Welwitsch.

44. **Barbus bynni.**

Lepidotus, *Athen.* vii. c. 17.
Cyprinus bynni, *Forsk.* p. 71. no. 103; *L. Gm.* i. p. 1414.
Béni, *Sonnini*, pl. 27. fig. 3.
Cyprinus lepidotus, *Geoffr. St. Hil. Descript. de l'Eg. Poiss.* pl. 10. fig. 2.
Barbus bynni, *Cuv. & Val.* xvi. p. 174.

D. 13. A. 8. L. lat. 35. L. transv. 7/5. Vert. 24/17.

The osseous dorsal ray is exceedingly strong, normally longer than, but frequently only as long as, the head, not serrated behind. There are three series of scales between the lateral line and the root of the ventral fin. *Upper and lower lip sometimes with a well-developed lobe, nearly as long as the eye, sometimes without a trace of it.* Body strongly compressed, back elevated below the origin of the dorsal fin, where the height of the body is one-third of the total length (without caudal). The length of the head is contained four times and one-third in the same length. Snout somewhat pointed, with thick lips; mouth inferior. Caudal deeply forked.

Nile.

a–e. Adult. Lower Nile. From Mr. Petherick's Collection.
f–n. Half-grown. Chartoum. From Mr. Petherick's Collection.
o. Half-grown. Upper Nile. From Mr. Petherick's Collection.
p. Adult: skeleton. Chartoum. From Mr. Petherick's Collection.

The *skeleton* is distinguished by the shortness of the vertebræ, their centrum being as deep as long. The interneurals of the enlarged dorsal spines are proportionally developed, the preceding interneural spines forming a continuous series to the occipital crest.

45. **Barbus nedgia.**

Labeobarbus nedgia, *Rüpp. Mus. Senckenb.* ii. 1837, p. 14, taf. 2. fig. 3.

D. 12. A. 9. L. lat. 32.

The osseous dorsal ray is of moderate strength, smooth. There are three and a half longitudinal series of scales between the lateral line and the root of the ventral. Body oblong, its depth being two-ninths of the total length (without caudal). The length of the head is two-sevenths of the same. Head low, elongate; eye small; snout rather prolonged; lips very thick, the lower produced into a long flap. Dorsal fin low; its origin is opposite to that of the ventral, and midway between the root of the caudal and the end of the snout. Anal fin rather narrow and deep; caudal forked. Coloration uniform. (*Rüpp.*)

Lake Zana.

46. Barbus zambezensis.

Labeobarbus zambezensis, *Peters, Monatsber. Ak. Wiss. Berlin*, 1852, p. 683.

D. 12. A. 8. L. lat. 34. L. transv. 5½/4.

Dorsal fin without enlarged osseous ray. There are three longitudinal series of scales between the lateral line and the root of the ventral. Body oblong, its depth being nearly equal to the length of the head, and contained thrice and two-thirds in the total (without caudal). Head rather low, moderately elongate; eye of moderate size; snout somewhat prolonged; both upper and lower lips produced into a longish flap. Dorsal fin elevated, commencing a little before the ventral, but nearer to the root of the caudal than to the end of the snout. Anal narrow and deep. Caudal deeply forked. Coloration uniform.

Zambezi.

This description is made from a drawing 5 inches long, kindly communicated to me by Prof. Peters.

47. Barbus perince.

Rüppell, Mus. Senckenb. ii. 1837, p. 12, taf. 2. fig. 2.

D. 11. A. 7. L. lat. 30. L. transv. 5½/4. Vert. 20/15.

The osseous dorsal ray is rather feeble, smooth. There are three series of scales between the lateral line and the root of the ventral fin. Body compressed and somewhat elevated, as in *Leuciscus rutilus*, its depth being one-third of the total length (without caudal); head small, its length being rather less than one-fourth of the total (without caudal); its depth equals its length (without snout). Eye rather large, equal to the length of the snout, two-sevenths of that of the head, and two-thirds of the width of the interorbital space, which is convex. Mouth anterior; lips thin, the lower with the transverse fold interrupted in the middle. Dorsal fin rather elevated, its origin is somewhat nearer to the end of the snout than to the root of the caudal. Caudal fin deeply forked. Bright silvery, with a bluish stripe from the scapula to the middle of the caudal, and sometimes with a small blackish spot on the root of the caudal.

Nile.

a–b, c–d. Adult. Nile. From Dr. Rüppell's Collection.
e–g. Adult (4 inches long). Lower Nile. From Mr. Petherick's Collection.

h–i. Adult. Nile. Purchased of J. Heckel.

k. Adult: skeleton (in spirits). Lower Nile. From Mr. Petherick's Collection.

48. Barbus trimaculatus.

Barbus (Dangila) trimaculatus, *Peters, Monatsber. Ak. Wiss. Berlin*, 1852, p. 683.

D. 11. A. 8. L. lat. 30. L. transv. 5/4.

No osseous dorsal ray. Three longitudinal series of scales between the lateral line and the root of the ventral. Body oblong, its height being one-fourth of its length (without caudal); the length of the head very little more; the depth of the head is less than its length, without snout. The diameter of the eye is one-fourth of the length of the head and about equal to that of the snout, which is somewhat obtuse. Mouth moderate; the lower barbel is long, much exceeding the upper one, and twice the diameter of the eye. The height of the dorsal fin is less than the depth of the body; its commencement is anterior to that of the ventral, and considerably nearer to the end of the snout than to the root of the caudal. Anal fin moderate; caudal not deeply forked; pectoral not reaching the root of the ventral. Three spots on each side of the body; the first above the lateral line, and before the dorsal, the second behind the dorsal, the third on the end of the lateral line.

Tette.

Prof. Peters has kindly communicated to me a drawing of this species, from which I have drawn up this description.

49. Barbus gobionoides.

Barbus gobionides, *Cuv. & Val.* xvi. p. 189.

? Barbus pallidus, *Smith, Ill. Zool. S. Afr. Pisces*, pl. 11. fig. 2.

D. 10. A. 7. L. lat. 26–30.

The osseous dorsal ray is very feeble and smooth. Head short, snout obtuse, eye small. Caudal fin emarginate, the other fins rounded. (*Val.*)

Cape of Good Hope; of small size.

This appears to be the place where we have to mention a fish, described by M. Castelnau in a publication entitled 'Mémoire sur les Poissons de l'Afrique australe,' p. 57, under the name of *Gnathendalia vulnerata*. To give an idea of the character of this publication, I add the diagnosis of this genus *Gnathendalia*:—"Corps allongé; bouche très-extensible par en dessous; pas de dents; rayons simples de la dorsale et de l'anale très faibles et flexibles." The author states that it has four barbels. He informs us that the fish is from the mission "Genadendal," evidently meaning the well-known Gnadenthal.

50. Barbus kessleri.

Puntius kessleri, *Steindachner, Verh. zool.-bot. Ges. Wien.* 1866, p. 768, taf. 14. fig. 3.

D. 9–10. A. 7. L. lat. 26. L. transv. $4\frac{1}{2}/4\frac{1}{2}$.

The osseous dorsal ray is strong, finely serrated, as long as the head, without snout. There are two and a half longitudinal series of scales between the lateral line and the root of the ventral fin. Body compressed, oblong, its depth is two-sevenths of the total length (without caudal), the length of the head nearly one-fourth. Snout of moderate length, a little longer than the eye, which is one-fourth of the length of the head; interorbital space convex; upper jaw overlapping the lower. The anterior barbel is a little shorter than the posterior, which is as long as the eye. Dorsal fin considerably lower than the body; its origin is somewhat behind that of the ventral, and midway between the end of the snout and the root of the caudal. Anal fin low and small. Fork of the caudal fin of moderate depth. Brownish above, silvery below, the membrane between the scales brown; a deep-black band, half as broad as a scale, runs from the snout through the eye to the end of the middle caudal rays. Top of the dorsal fin black.

West Africa.

a–e. Adult, from 3 to $3\frac{1}{2}$ inches long. Fluilla (Angola). Presented by Dr. Welwitsch.

f, g–h. Fine specimens. River Ogome (Gaboon). From Mr. Walker's Collection.

51. Barbus labecula.

Cuv. & Val. xvi. p. 185.

D. 11. A. 7. L. lat. 26. L. transv. 10.

The osseous dorsal ray is very slender and smooth. The height of the body is contained thrice and one-third in the total length (with the caudal), the length of the head five times and a half. Barbels small. A silvery streak along the side, a small black spot above this streak, on the sixth series of scales. (*Val.*)

North Africa ?; Jordan ?

52. Barbus caudimacula.

D. 11. A. 7. L. lat. 26. L. transv. $4\frac{1}{2}/4\frac{1}{2}$.

The osseous dorsal ray is of moderate strength, its stiff portion being three-fifths as long as the head; its serrature is very conspicuous, though fine. There are two and a half longitudinal series of scales between the lateral line and the root of the ventral fin. Body strongly compressed, its depth is contained thrice and a half in the total length (without caudal) in males, and thrice and one-third in females. Head of moderate size, its length being a little less than one-fourth of the total (without caudal). Snout rather short, convex, scarcely as long as the diameter of the eye, which is contained thrice and two-thirds in the length of the head; upper jaw overlapping the lower. The posterior barbels are longer than the anterior, which are as long as the eye. Dorsal fin considerably lower than the body; its origin is opposite that of the ventral, and midway between the end of the snout and the root of the caudal. Anal fin of moderate depth, the rays not reaching to the caudal, if laid backwards. Fork of the caudal fin of moderate depth. Uniformly coloured; a small round black spot on the termination of the lateral line.

Angola.

a. Numerous adult examples, from 2 to 3 inches long, Polungo Alto. Presented by Dr. Welwitsch.

53. Barbus fasciolatus.

D. 11. A. 7. L. lat. 23. L. transv. 4/4.

No osseous dorsal ray. There are two longitudinal series of scales between the lateral line and the root of the ventral. Body oblong, its height being contained thrice and two-thirds in the total length (without caudal), the length of the head four times. The diameter of the eye equals the width of the interorbital space, is one-third of the length of the head, and more than that of the snout, which is obtuse. Mouth inferior, small; the lower barbel is longer than the upper, about as long as the eye. The dorsal fin is elevated in front, about as high as the body; it commences nearly opposite the origin of the ventrals, and its first ray is equidistant from the end of the snout and the root of the caudal. Anal fin not very narrow; fork of the caudal fin moderately deep. The pectoral fin extends nearly to the ventral. Sides with about twelve narrow blackish-blue vertical streaks, none of which extends to the back or belly; the second, midway between the gill-opening and the dorsal, is dilated into a spot; a small round spot on the middle of the base of the caudal. Base of the anal fin bluish black.

Angola.

a. Twenty-eight lines long. Fluilla. Presented by Dr. Welwitsch.

54. Barbus trispilus.

Puntius (Barbodes) trispilos, *Bleek. Poiss. Côte de Guinée, in Mém. Soc. Holl. Haarlem,* 1862, p. 113, tab. 23. fig. 3.

D. 11. A. 8. L. lat. 26–27. L. transv. 4/5.

No osseous dorsal ray. There are three longitudinal series of scales between the lateral line and the root of the ventral. The height of the body is contained from thrice and two-fifths to thrice and one-fourth in the total length (without caudal), the length of the head four times or four times and one-fourth. The diameter of the eye is one-third, or somewhat less than one-third, of the length of the head, and not quite equal to the width of the interorbital space. Snout rather shorter than the eye, somewhat obtuse; barbels scarcely longer than the eye. The origin of the dorsal fin is opposite to that of the ventrals, and somewhat nearer to the end of the snout than to the root of the caudal. Three round black spots on each side: one in front and one behind the dorsal fin, and the third on the end of the tail. *(Blkr.)*

Guinea (Dabo-Crom).

b. *West Asiatic.*

55. Barbus grypus.

Heckel, in Russegger, Reisen, i. p. 1048, *Fische,* taf. 3. fig. 1.

D. 11. A. 8. L. lat. 40. L. transv. $5/3+x$.

The osseous dorsal ray robust, not flexible, not serrated. There are three longitudinal series of scales between the lateral line and the base of the ventrals. Body rather elongate, subcylindrical. Snout not produced, with the mouth inferior, and with the lips rather thick, the lower with a continuous transverse fold. Eyes small. Anal fin twice as high as broad. Body immaculate. *(Heck.)*

River Tigris, near Mossul.

56. Barbus kotschyi.

Labeobarbus kotschyi, *Heckel, l. c.* p. 1049, taf. 3. fig. 2.

D. 11. A. 8. L. lat. 37. L. transv. $4/3+x$.

The osseous dorsal ray is of moderate strength, not serrated. There are three longitudinal series of scales between the lateral line and the base of the ventral fin. Body rather elongate. Snout somewhat produced, with the mouth inferior, and with thick lips, the lower being provided with a longish lobe. Eyes small. Anal fin twice as high as broad. Body immaculate. *(Heck.)*

River Tigris, near Mossul.

This species is so closely allied to *B. grypus*, that we cannot help thinking that the labial lobe may prove to be not a character of specific value.

57. Barbus canis.

Cuv. & Val. xvi. p. 186, pl. 468.

D. 12. A. 8. L. lat. 32–33*. L. transv. $4\frac{1}{2}/4$.

The osseous dorsal ray is rather feeble, smooth, its stiff portion being one-third or one-half as long as the head. There are two and a half or three series of scales between the lateral line and the root of the ventral fin. Body compressed, moderately elongate, with the profile of the back arched; its depth equals the length of the head, and is contained thrice and one-third or thrice and a half in the total (without caudal); head rather large, its depth equal to its length, without snout. Eye rather small, much shorter than the snout, even in young examples. Mouth anterior, the jaws being equal or subequal in length in half-grown examples, and the lower jaw projecting slightly beyond the upper in old ones. Lips thin, the transverse fold of the lower interrupted in the middle; barbels small. The origin of the dorsal fin is opposite that of the ventrals, and nearer to the root of the caudal than to the end of the snout. Caudal fin deeply forked.

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* Prof. Duméril has, at my request, examined the typical specimens, and found 32–33 scales in the lateral line, and not 27, as stated by Valenciennes.

Jordan.

a–f. Fine specimens, from 8 to 19 inches long. Jordan. From the Collection of the Rev. H. B. Tristram.

58. **Barbus beddomii.**

D 13. A. 8. L. lat. 28. L. transv. $5\frac{1}{2}/5$.

The osseous dorsal ray is rather strong, smooth, its stiff portion being half as long as the head; ten soft rays behind it. There are two and a half longitudinal series of scales between the lateral line and the root of the ventral fin. Body slightly compressed, oblong, its depth being contained thrice and three-fourths in the total length (without caudal), the length of the head thrice and one-fourth. Snout rather produced, the hind margin of the orbit being exactly in the middle of the length of the head. The diameter of the eye is somewhat less than the extent of the snout, or than one-fourth of the length of the head. The upper barbel is minute and easily overlooked, the lower about half as long as the eye. Upper jaw overlapping the lower. Interorbital space flat. Origin of the dorsal fin a little in advance of that of the ventral, and nearer to the root of the caudal fin than to the end of the snout. Anal fin moderately deep, its rays not extending to the root of the caudal, if laid backwards. Fork of the caudal fin of moderate depth. Body uniform silvery.

Lake of Galilee.

a. Four inches long. Collected by the late Th. W. Beddome, Esq., and presented by B. B. Beddome, Esq.

c. *Indian.*

aa. *The third dorsal ray is strong and serrated.*

59. **Barbus enoplus.**

Barbus enoplos, *Bleek. Verh. Bat. Gen.* xxiii. *Oost-Java*, p. 16.
—— macracanthus, *Bleek. Nat. Tydschr. Ned. Ind.* v. p. 516.
Cyclocheilichthys enoplus, *Bleek. Prodr. Cypr.* p. 366; or *Atl. Ichthyol. Cypr.* p. 82, pl. 27. fig. 2.
—— macracanthus, *Bleek. Prodr. Cypr.* p. 367; or *Atl. Ichthyol. Cypr.* p. 83, pl. 24. fig. 2.

D. 12. A. 8. L. lat. 39–40. L. transv. 6/6.

Each tube of the lateral line is bifid at its extremity. Osseous dorsal ray very strong and serrated, followed by eight soft rays; its stiff portion is as long as the head. There are four longitudinal series of scales between the lateral line and the root of the ventral. Body oblong, compressed, profile of the back arched, its height is contained thrice or thrice and one-fourth in the total length (without caudal); the length of the head is one-fourth, or a little more than one-fourth, of the same; the greatest depth of the head is equal to its length, without snout. The diameter of the eye is about one-fourth of the length of the head, and equal to, or in old individuals a little less than, that of the snout. Barbels very small. Height of dorsal fin not much less than the depth of the body; its commencement is a little anterior to the ventral, and midway between the end of the snout and the root of the caudal. Caudal fin deeply forked; the pectoral extends to the root of the ventral. Coloration uniform.

Java and Sumatra.

a. Type of the species. Java. From Dr. Bleeker's Collection.
b. One of the typical specimens of *C. macracanthus*. Sumatra. From Dr. Bleeker's Collection.

60. Barbus armatus.

Barbus armatus, *Cuv. & Val.* xvi. p. 163.
—— valenciennesii, *Bleek. Verh. Bat. Gen.* xxiii. *Oost-Java*, p. 17.
Cyclocheilichthys armatus, *Bleek. Prodr. Cypr.* p. 368; or *Atl. Ichthyol. Cypr.* p. 84, pl. 24. fig. 1.

D. 11. A. 8. L. lat. 36. L. transv. 7/6½.

Osseous dorsal ray very strong and serrated, followed by eight soft rays; the length of its stiff portion equals that of the head. Four longitudinal series of scales between the lateral line and the root of the ventral. Body oblong, compressed, its height being contained twice and three-fifths or twice and four-fifths in the total length (without caudal); the length of the head is one-fourth of the same. The diameter of the large eye is a little less than the length of the snout, and more than one-fourth of that of the head. Mouth small, with the upper jaw overlapping the lower; barbels minute. The height of the dorsal fin is conspicuously less than the depth of the body; its commencement is distinctly behind that of the ventral, and midway between the root of the caudal and the end of the snout. Caudal deeply forked; the pectoral reaches to the root of the ventral. The least depth of the tail is a little more than one-half of the length of the head. Coloration uniform.

Java and Sumatra.

a, b Types of the species. From Dr. Bleeker's Collection.

This fish is so similar to *Barbus siaja*, that many ichthyologists may be inclined to regard them merely as varieties. The number of barbels is a character without value for establishing genera. One of the two specimens just mentioned has two barbels only, and consequently would belong to the Bleekerian genus *Siaja*.

61. Barbus repasson.

Barbus repasson, *Bleek. Nat. Tydschr. Ned. Ind.* iv. p. 295.
Cyclocheilichthys repasson, *Bleek. Prodr. Cypr.* p. 370; or *Atl. Ichthyol. Cypr.* p. 84, pl. 25. fig. 1.

D. 12. A. 8. L. lat. 36. L. transv. 6½/6.

Osseous dorsal ray very strong and serrated, followed by eight soft rays; the length of its stiff portion equals that of the head. Four longitudinal series of scales between the lateral line and the root of the ventral. Body oblong, compressed, its height being contained twice and four-fifths in the total length (without caudal); the length of the head is contained thrice and one-half in the same; the diameter of the large eye is about equal to the length of the snout, and not quite one-third of that of the head; mouth rather small, with the upper jaw slightly overlapping the lower; barbels minute. The height of the dorsal fin is slightly less than the depth of the body; its commencement is scarcely behind that of the ventral, and nearer to the root of the caudal than to the end of the snout. Caudal deeply forked; the pectoral reaches beyond the root of the ventral. The least depth of the tail is one-half or a little less than one-half of the length of the head. A round blackish spot on the end of the lateral line.

Sumatra.

a. Typical specimen. From Dr. Bleeker's Collection.

62. **Barbus macularius.**

Systomus (?) macularius, *Blyth, Journ. As. Soc. Beng.* 1860, p. 159.

L. lat. 35–36. L. transv. 12.

"Muzzle unusually prolonged anterior to the nostrils, where showing a considerable concavity above. The height of the body is one-fourth of the total length (with the caudal). Osseous dorsal ray unusually large in every way, and strongly serrated behind. Each scale with a distinct shining blackish spot at tip."

Sitang River (Tennasserim).

63. **Barbus schwanefeldi.**

Barbus schwanefeldi, *Bleek. Nat. Tydschr. Ned. Ind.* v. p. 517.

$\left.\begin{array}{l}\text{Systomus}\\ \text{Puntius}\end{array}\right\}$ (Barbodes) schwanefeldi, *Bleek. Prodr. Cypr.* p. 323; or *Atl. Ichthyol. Cypr.* p. 94, tab. 35. fig. 2.

$\left.\begin{array}{l}\text{Systomus}\\ \text{Puntius}\end{array}\right\}$ (Barbodes) belinka, *Bleek. Prodr. Cypr.* p. 321; or *Atl. Ichthyol. Cypr.* p. 93, tab. 37. fig. 1.

D. 11. A. 8. L. lat. 35–36. L. transv. $\frac{7\frac{1}{2}-8}{7}$.

The osseous dorsal ray is rather strong, its stiff portion being as long as the head, without snout; it is coarsely serrated. There are four longitudinal series of scales between the lateral line and the root of the ventral fin. Body strongly compressed, elevated, with the profile of the back arched; its depth is contained twice and one-fifth or twice and one-half in the total length (without caudal); head of moderate size, its length being one-fourth of the total (without caudal); snout very short, much shorter than the eye, which is one-third of the length of the head; barbels rather longer than the eye. The origin of the dorsal fin is a little behind the vertical from that of the ventrals, and midway between the end of the snout and the root of the caudal. A blackish band runs along each lobe of the caudal fin; upper part of the dorsal blackish.

Sumatra and Borneo.

a. Adult, typical specimen. Sumatra. From Dr. Bleeker's Collection.

b. Young, one of the typical specimens of *B. belinka*. Sumatra. From Dr. Bleeker's Collection.

64. Barbus immaculatus.

Systomus immaculatus, *M'Clell. Ind. Cypr.* pp. 284, 380, tab. 44. fig. 5 (bad).
—— chrysosomus, *M'Clell. Ind. Cypr.* p. 284 (variety?).
Cyprinus m'clellandi, *Cuv. & Val.* xvi. p. 390.
Barbus duvaucelii, *Cuv. & Val.* xvi. p. 167.

D. 11. A. 8. L. lat. 31–33. L. transv. 6/6.

The osseous dorsal ray is of moderate strength and finely serrated behind, its stiff portion being two-thirds as long as the head. There are four series of scales between the lateral line and the root of the ventral fin. Body strongly compressed, somewhat elevated, as in *Leuciscus rutilus*, with the profile of the back arched; its depth is contained twice and one-half in the total length (without caudal); head small, its length being contained four times and one-third in the total (without caudal); snout short, obtuse, as long as the diameter of the eye, which is one-fourth of the length of the head; barbels small, not longer than the eye. The origin of the dorsal fin is opposite to that of the ventrals, and midway between the end of the snout and the root of the caudal. Uniform silvery.

Mountain-streams of Assam, of the Himalayas, and Hindoo Koosh; Bengal.

a–b. Adult: stuffed. India.

c. Fine specimen, 7 inches long. Sikkim. From the Collection of Messrs. von Schlagintweit.

d. Adult: stuffed. Calcutta. Presented by R. Blyth, Esq.

e–f. Skins, 11 and 7 inches long. Loodianah. From Griffith's Collection.

g. Skin, half-grown. Peshawar. From Griffith's Collection.

65. Barbus chrysopoma.

Barbus chrysopoma, *Cuv. & Val.* xvi. p. 165, pl. 466 (description faulty).
? Barbus gibbosus, *Cuv. & Val.* xvi. p. 155.
Systomus chrysopoma, *Jerdon, Madr. Journ. Lit. & Sc.* xv. p. 314.
Puntius chrysopoma, *Day, Fish. Malab.* p. 208.

D. 11. A. 8. L. lat. 29. L. transv. 5–4½.

The osseous dorsal ray is strong, finely serrated behind, and two-thirds as long as the head. There are three or three and a half series of scales between the lateral line and the root of the ventral fin. Body strongly compressed, somewhat elevated, as in *Leuciscus* *rutilus*, with the profile of the back arched; its depth is contained from twice and three-fourths to thrice in the total length (without caudal); head of moderate size, its length being one-fourth of the total (without caudal); snout short, obtuse, as long as the diameter of the eye, which is one-fourth of the length of the head (in adult examples); barbels rather small, scarcely as long as the eye. The origin of the dorsal fin is a little behind that of the ventrals, and midway between the end of the snout and the root of the caudal. Silvery, frequently with series of small black spots along the rows of scales on and above the lateral line; they disappear with age, those of the lateral line being the most constant. Generally a large blackish blotch on the side of the end of the tail.

Peninsula of India.

a–b. Adult. Cuttalai River. Presented by Capt. Mitchell.
c. Adult. Poona. Presented by Lieut.-Col. Playfair.

66. Barbus pinnauratus.

Cyclocheilichthys pinnauratus, *Day, Proc. Zool. Soc.* 1865, p. 300.
Puntius pinnauratus, *Day, Fish. Malab.* p. 209, pl. 15. fig. 2.

Very closely allied to *B. chrysopoma*, but with the body apparently deeper *

D. 11. A. 8. L. lat. 29. L. transv. 6/5.

The osseous dorsal ray is of moderate strength and very finely serrated behind. There are three and a half series of scales between the lateral line and the root of the ventral fin. Body strongly compressed, somewhat elevated, with the profile of the back arched; its depth is two-fifths of the total length (without caudal), the length of the head a little more than one-fourth; snout short, obtuse, as long as the diameter of the eye, which is one-fourth of the length of the head; barbels small, not longer than the eye. The origin of the dorsal fin is opposite to that of the ventrals, and nearly midway between the end of the snout and the root of the caudal. An ovate black spot on the end of the lateral line.

Cochin.

67. Barbus spilurus.

Puntius (Barbodes) chrysopoma, *Bleek. Cobit. & Cypr. Ceylon, in Mém. Soc. Holl. Harlem*, 1864, p. 15, tab. 3. fig. 1 (not *Cuv. & Val.*).

Closely allied to *B. chrysopoma*, but with the osseous dorsal ray less strong, and with longer barbels.

D. 11. A. 8. L. lat. 26–27. L. transv. 5/5.

The osseous dorsal ray is of moderate strength, finely serrated behind, and not quite two-thirds of the length of the head. There are three series of scales between the lateral line and the root of the ventral fin. Body strongly compressed, somewhat elevated, as in *Leuciscus rutilus*, with the profile of the back arched; its depth is two-fifths or a little more than one-third of the total length

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* The author does not state whether the specimens from which he drew up his description were preserved in spirits or merely skins.

(without caudal); head of moderate size, its length being one-fourth or rather more than one-fourth of the total (without caudal); snout rather short, scarcely obtuse, as long as the diameter of the eye, which is more than one-fourth of the length of the head; barbels of moderate length, longer than the eye. The origin of the dorsal fin is nearly opposite to that of the ventrals, and midway between the end of the snout and the root of the caudal. Silvery, with a large deep-black blotch on the side of the end of the tail.

Ceylon.

a, b, c–h. Adult (6½ inches), half-grown, and young. Purchased of Mr. Cuming.

68. **Barbus laoensis.**

D. 11. A. 8. L. lat. 30. L. transv. 6/4.

The osseous dorsal ray is rather coarsely serrated and rather strong, its stiff portion being as long as the head, without snout. There are three longitudinal series of scales between the lateral line and the root of the ventral fin. Body compressed, oblong, *its depth being one-third of the total length (without caudal)*; the length of the head is contained thrice and four-fifths in it; snout rather obtuse, as long as the diameter of the eye, which is two-sevenths of the length of the head; barbels nearly of equal length, and as long as the eye; upper jaw overlapping the lower; interorbital space narrow, flat. The dorsal fin is considerably lower than the body; its origin somewhat behind that of the ventral, and nearer to the root of the tail than to the end of the snout. Anal fin moderately deep; its rays not reaching, by far, the root of the caudal, if laid backwards. Body uniform silvery.

Cochin-China.

a. Three and a half inches long. Laos Mountains. From M. Mouhot's Collection.

69. **Barbus balleroides.**

Cuv. & Val. xvi. p. 158.

D. 12. A. 8. L. lat. 30. L. transv. 13.

Osseous dorsal ray rather strong and serrated. The height of the body is one-half of the total length (without caudal); head small, one-fifth of the total length. The diameter of the eye is one-third of the length of the head; *snout pointed*; the barbels appear to be about as long as the eye. (*Val.*)

Habitat ——?

70. **Barbus sarana.**

Cyprinus sarana, *Ham. Buch. Fish. Gang.* p. 307.
Barbus deliciosus, *M'Clell. Ind. Cypr.* p. 342, tab. 39. fig. 3.
Barbus gardonides, *Cuv. & Val.* xvi. p. 156 (*ex p.*), pl. 465; *Bleek. Verh. Bat. Gen. Nederl. Ind.* xxv. 1853, p. 126.
Puntius sarana, *Steindachner, Sitzgsber. Ak. Wiss. Wien*, lvi. p.

D. 11. A. 8. L. lat. 31. L. transv. 5½/6.

The osseous dorsal ray is somewhat feeble, finely serrated behind, its stiff portion being two-thirds as long as the head. There are three and a half series of scales between the lateral line and the root of the ventral fin. Body strongly compressed, somewhat elevated, as in *Leuciscus rutilus*, with the profile of the back arched; its depth is contained twice and three-fifths in the total length (without caudal); head broad, its length being two-sevenths of the total (without caudal); interorbital space very slightly convex; snout short, obtuse, shorter than the diameter of the eye, which is more than one-fourth of the length of the head, in examples four or five inches long; barbels of moderate length, about as long as the eye. The origin of the dorsal fin is opposite to that of the ventrals, and nearly midway between the end of the snout and the root of the caudal. Coloration uniform; caudal without blackish bands.

Bengal, Assam.

a. Four inches long. Ganges. From Dr. M'Clelland's Collection.
b. Four and a half inches long. River Hooghly. From Dr. Bleeker's Collection.
c. Five inches long. Cossye River. Presented by Lieut. R. C. Beavan.

71. Barbus rubripinnis.

Barbus rubripinnis, (*Kuhl & v. Hass.*) *Cuv. & Val.* xvi. p. 194; *Bleek. Nat. Tydschr. Ned. Ind.* ix. p. 406.
—— orphoides, *Cuv. & Val.* xvi. p. 193.
—— gardonides, spec. javan., *Cuv. & Val.* xvi. p. 157.
—— sarananella, *Bleek. Verh. Bat. Gen.* xxiii. *Oost-Java*, p. 16.
Systomus / Puntius } (Barbodes) rubripinna, *Bleek. Prodr. Cypr.* p. 338; or *Atl. Ichth. Cypr.* p. 100, tab. 33. fig. 3.

D. 11. A. 8. L. lat. 29. L. transv. $5\frac{1}{2}/5\frac{1}{2}$.

The osseous dorsal ray is strong, finely serrated behind, its stiff portion being two-thirds as long as the head. There are three or three and a half series of scales between the lateral line and the root of the ventral fin. Body strongly compressed, somewhat elevated, as in *Leuciscus rutilus*, with the profile of the back arched; its depth is contained twice and two-thirds in the total length (without caudal); head broad, its length being rather less than one-fourth of the total (without caudal); interorbital space very convex; snout short, obtuse, but much longer than the diameter of the eye, which is very small, one-fifth or one-sixth of the length of the head, in adult examples, and situated far below the upper profile of the head; barbels of moderate length, rather longer than the eye. The origin of the dorsal fin is opposite to that of the ventrals, and midway between the end of the snout and the root of the caudal. Caudal fin with a broad blackish marginal band above and below.

Java.

a, b. Fine specimens, 10 and 7 inches long. Java.

Barbus caudimarginatus, Blyth, Journ. As. Soc. Beng. 1860, p. 157, from the Sitang River, Tennasserim, cannot be distinguished from the preceding species by means of the short description given.

72. Barbus bramoides.

Barbus bramoides, *Cuv. & Val.* xvi. p. 160.
—— wadon, *Bleek. Verh. Bat. Gen.* xxiii. *Oost-Java*, p. 14.
—— amblycephalus, *Bleek. Nat. Tydschr. Ned. Ind.* viii. p. 166.
—— macrophthalmus, *Bleek. l. c.* ix. p. 404 (young).
Systomus / Puntius (Barbodes) bramoides, *Bleek. Prodr. Cypr.* p. 323; or *Atl. Ichth. Cypr.* p. 95, tab. 25. fig. 2.
Systomus / Puntius (Barbodes) amblycephalus, *Bleek. Prodr. Cypr.* p. 324; or *Atl. Ichth. Cypr.* p. 94, tab. 36. fig. 2 (scales not good).
Systomus / Puntius (Barbodes) macrophthalmus, *Bleek. Prodr. Cypr.* p. 335; or *Atl. Ichth. Cypr.* p. 99, tab. 35. fig. 1.

D. 11. A. 8. L. lat. 29. L. transv. $6\frac{1}{2}/5\frac{1}{2}$.

The osseous dorsal ray is strong, its stiff portion being not much shorter than the head; it is coarsely serrated; anterior anal ray osseous. There are three longitudinal series of scales between the lateral line and the root of the ventral fin. Body strongly compressed, elevated, with the profile of the back arched; its depth is two-fifths of the total length (without caudal), the length of the head one-fifth; snout very short and obtuse, much shorter than the eye, which is one-third of the length of the head; barbels about as long as the eye. The origin of the dorsal fin is somewhat behind the vertical from that of the ventrals, and a little nearer to the root of the caudal than to the end of the snout. Coloration uniform.

Java and Borneo.

a. Type of *B. amblycephalus* (Blkr.). Borneo. From Dr. Bleeker's Collection. This specimen has twenty-nine scales in the lateral line, and not thirty-five as stated by Dr. Bleeker.
b. Adult. Java. From Dr. Bleeker's Collection.
c. Young. Java. From Dr. Bleeker's Collection. One of the types of *B. macrophthalmus*. The anterior anal ray is osseous and strong, a peculiarity omitted in the drawing given by Bleeker.

Barbus hypselonotus, (Kuhl & v. Hass.) Cuv. & Val. xvi. p. 168, cannot be recognized. Bleeker, indeed, describes and figures two small specimens under the same name, varying at various times the generic name (*Systomus*, *Puntius*, *Barbodes*); but, after carefully examining his descriptions (Nat. Tydschr. Ned. Ind. xiii. p. 349; Prodr. Cypr. p. 334; Atl. Ichthyol. Cypr. p. 98, tab. 34. fig. 3) and comparing the specimen, I am much inclined to regard this *B. hypselonotus* as founded on young examples of *B. bramoides*, or at least of a species most closely allied to it. The barbels are of the same length, the scales are in numbers nearly identical, the lateral line being erroneously traced in the figure given by Bleeker, viz. in the fifth series of scales above the ventrals, instead of in the fourth. It is true that the eye of the specimen named *B. macrophthalmus* is *a little* larger, and that the dorsal spine of *B. hypselonotus* is a little less strong; but these are not characters on which to found species, especially if nothing but a few young examples are available for examination.

a. Young, bad state. Java. From Dr. Bleeker's Collection.—Type of *B. hypselonotus.*

73. Barbus erythropterus.

Barbus erythropterus, *Bleek. Verh. Bat. Genootsch.* xxiii. *Oost-Java,* p. 15.

Systomus }
Puntius } (Barbodes) erythropterus, *Bleek. Prodr. Cypr.* p. 325; or *Atl. Ichth. Cypr.* p. 95, tab. 26. fig. 1.

D. 11. A. 9. L. lat. 29. L. transv. 7/5.

The osseous dorsal ray is very strong, its stiff portion being longer than the head; it is rather coarsely serrated. There are three longitudinal series of scales between the lateral line and the root of the ventral fin. Body strongly compressed, elevated, with the profile of the back arched; its depth is contained twice and one-fourth in the total length (without caudal); head rather small, its length being a little less than one-fourth of the total (without caudal); snout rather short, a little shorter than the eye, which is two-sevenths of the length of the head; barbels about as long as the eye. The origin of the dorsal fin is a little behind the vertical from that of the ventrals, and somewhat nearer to the root of the caudal than to the end of the snout. The least depth of the tail is contained once and a half or once and three-fifths in the length of the head. Coloration uniform.

Java and Borneo.

a. One of the typical specimens, 8 inches long. Java. From Dr. Bleeker's Collection.

74. Barbus javanicus.

Barbus javanicus, *Bleek. Nat. Tydschr. Ned. Ind.* ix. p. 403.
—— koilometopon, *Bleek. l. c.* xiii. p. 347.

Systomus }
Puntius } (Barbodes) javanicus, *Bleek. Prodr. Cypr.* p. 328; or *Atl. Ichth. Cypr.* p. 96, tab. 37. fig. 1.

Systomus }
Puntius } (Barbodes) koilometopon, *Bleek. Prodr. Cypr.* p. 330; or *Atl. Ichth. Cypr.* p. 97, tab. 30. fig. 1 (barbels much too long).

D. 11–12. A. 8–9. L. lat. 29–31. L. transv. 6/5½.

The osseous dorsal ray is very strong, its stiff portion being not much shorter than the head; its serrature is very coarse, with comparatively few denticulations. There are three longitudinal series of scales between the lateral line and the root of the ventral fin. Body strongly compressed, elevated, with the profile of the back arched, concave above the occiput; the height of the body is two-fifths, and sometimes more than two-fifths, of the total length (without caudal); head of moderate size, its length being one-fourth or two-ninths of the total (without caudal); snout short, but somewhat pointed, as long as or a little longer than the diameter of the eye, which is less than one-fourth of the length of the head; barbels very small, especially the upper, which sometimes disappear entirely. The origin of the dorsal fin is behind the vertical from that of the ventrals, and a little nearer to the root of the caudal than to the end of the snout. Coloration uniform.

Java and Sumatra.

a, b. Adult. Java.
c, d. Half-grown. Java. From Dr. Bleeker's Collection.—Types of *B. koilometopon*.

I do not think that *B. koilometopon* is specifically different from *B. javanicus*. The specimen figured by Bleeker has the body conspicuously elevated, the pectoral extending beyond the base of the ventral; but this is much less the case in the second specimen, so that it is even doubtful whether this form can be considered a constantly distinct variety.

75. Barbus altus.

D. 11. A. 7. L. lat. 32. L. transv. 8/7.

The osseous dorsal ray is of moderate strength, its stiff portion being as long as the head, without snout; *its serrature is very coarse, so that its upper half is armed with only five very distant teeth.* There are four longitudinal series of scales between the lateral line and the root of the ventral fin. Body strongly compressed, much elevated, with its upper profile much arched, *its depth being one-half only of the total length* (*without caudal*); head of moderate size, its length being contained thrice and two-fifths in the total (without caudal); *snout obtuse*, much shorter than the eye, the diameter of which is one-third of the length of the head; barbels shorter than the eye; cleft of the mouth obliquely ascending forwards, with the jaws equal in length. The origin of the dorsal fin is nearer to the root of the caudal than to the end of the snout, somewhat behind the vertical from the origin of the ventral. Pectoral reaching slightly beyond the root of the ventral. Caudal fin deeply forked. Coloration uniform; a large black blotch on the top of the dorsal fin.

Siam.

a. Three and a half inches long. Purchased of Mr. Jamrach.
b–d. Three inches long. From M. Mouhot's Collection.

76. Barbus gonionotus.

Barbus gonionotus, *Bleek. Verh. Bat. Gen.* xxiii. *Oost-Java*, p. 15.
Systomus { Puntius { (Barbodes) gonionotus, *Bleek. Prodr. Cypr.* p. 231: or *Atl. Ichthyol. Cypr.* p. 97, tab. 28. fig. 1.

D. 11. A. 9. L. lat. 29–30. L. transv. 6/5.

The osseous dorsal ray is very strong, its stiff portion being as long as the head; its serrature is very coarse, the denticulations being far apart. There are three and a half longitudinal series of scales between the lateral line and the root of the ventral fin. Body strongly compressed, elevated, with the profile of the back arched, not concave above the occiput; its depth is two-fifths of the total length (without caudal); head rather small, its length being two-ninths of the total (without caudal); snout short, obtuse, shorter than the diameter of the eye, which is rather more than one-fourth of the length of the head; barbels very small, especially the upper, much shorter than the eye. The origin of the dorsal fin is immediately behind the root of the ventrals, and nearer to the root of the caudal than to the end of the snout. Coloration uniform.

Java, Siam.

a. Type of the species. Java. From Dr. Bleeker's Collection.
b–c. Young. Siam. From M. Mouhot's Collection.

77. **Barbus huguenini.**

Barbus huguenini, *Bleek. Nat. Tydschr. Ned. Ind.* iv. p. 294.
Systomus / Puntius } (Barbodes) huguenini, *Bleek. Prodr. Cypr.* p. 332; or *Atl. Ichthyol. Cypr.* p. 98, tab. 32. fig. 3.

D. 11. A. 8. L. lat. 31. L. transv. 6/5.

The osseous dorsal ray is strong, its stiff portion being longer than the head (without snout); its serrature is very conspicuous and rather coarse, the denticulations being numerous and closely set. There are three longitudinal series of scales between the lateral line and the root of the ventral fin. Body strongly compressed, somewhat elevated, as in *Leuciscus rutilus*, with the profile of the back straight; its depth is contained twice and two-thirds in the total length (without caudal); head rather small, its length being two-ninths of the total (without caudal); snout short, as long as the diameter of the eye, which is two-sevenths of the length of the head; barbels rather small, about as long as the eye. The origin of the dorsal fin is a little behind the vertical from that of the ventrals, and midway between the end of the snout and the root of the caudal. Coloration uniform.

Sumatra.

a. Type of the species. River Ombiling. From Dr. Bleeker's Collection.

78. **Barbus pleurotænia.**

Puntius (Barbodes) pleurotænia, *Bleeker, Cobit. & Cypr. Ceylon, in Nat. Verhandl. Holl. Maatsch. Harlem,* 1864, p. 13, tab. 3. fig. 2.

D. 11. A. 8. L. lat. 28. L. transv. 5/4½.

The osseous dorsal ray is very strong, as long as the head, and finely serrated behind. There are two series of scales between the lateral line and the root of the ventral fin. Body strongly compressed, somewhat elevated, as in *Leuciscus bipunctatus*, with the profile of the back slightly arched; its depth is one-third of the total length (without caudal); head of moderate size, its length being one-fourth of the total (without caudal); snout of moderate length, somewhat pointed, a little longer than the diameter of the eye, which is rather more than one-fourth of the length of the head; barbels of moderate length, somewhat longer than the eye. The origin of the dorsal fin is a little behind that of the ventrals, and midway between the end of the snout and the root of the caudal. A black band along the middle of the side, from the eye to the end of the middle caudal rays.

Ceylon.

a–b. Fine adult examples. Purchased of Mr. Cuming.
c–e. Adult and half-grown. Purchased of Mr. Cuming.

79. Barbus obtusirostris.

Barbus obtusirostris, (*v. Hass*) *Cuv. & Val.* xvi. p. 167.
—— marginatus, *Cuv. & Val.* xvi. p. 164; *Bleek. Nat. Tydschr. Ned. Ind.* v. p. 518.
Puntius (Barbodes) obtusirostris, *Bleek. Atl. Ichth. Cypr.* p. 106, tab. 32. fig. 1.

D. 11. A. 11. L. lat. 26–28. L. transv. 5/4½.

The osseous dorsal ray is rather strong, its stiff portion not being much shorter than the head; its serrature is very conspicuous, and not very fine. There are three longitudinal series of scales between the lateral line and the root of the ventral fin. Axillary scale of the ventral much developed, two-thirds as long as the fin. Body strongly compressed, somewhat elevated, as in *Leuciscus rutilus*, with the profile of the back arched; its depth is two-fifths of the total length (without caudal); snout very short, shorter than the diameter of the eye, which is one-third, or a little less than one-third, of the length of the head; the length of the head is two-ninths of the total (without caudal); barbels very small, shorter than the eye. The origin of the dorsal fin is in the vertical from that of the ventrals, and midway between the end of the snout and the root of the caudal. Uniformly coloured.

Java, Sumatra, Borneo.

a, b. Adult. Java.
c. Adult. Java. From Dr. Bleeker's Collection.

80. Barbus russellii.

Kunnamoo, *Russell*, ii. pl. 204.
Barbus sarana, *Cuv. & Val.* xvi. p. 151; *Jerdon, Madr. Journ. Lit. & Sc.* xv. p. 312 (not *Ham. Buch.*)

D. 11. A. 8. L. lat. 27. L. transv. 6/5.

The osseous dorsal ray is strong and finely serrated behind, its stiff portion being two-thirds as long as the head. There are three and a half series of scales between the lateral line and the root of the ventral fin. Body strongly compressed, somewhat elevated, as in *Leuciscus rutilus*, with the profile of the back arched; its depth is contained twice and three-fourths in the total length (without cauual); head small, its length being nearly one-fourth of the total (without caudal); snout short, obtuse, as long as the diameter of the eye, which is one-fourth of the length of the head; barbels small, not longer than the eye. The origin of the dorsal fin is opposite to that of the ventrals, and midway between the end of the snout and the root of the caudal. Uniform silvery.

Western and southern parts of British India.

a-b. Five inches long. Indus at Sabzilkot. From the Collection of Messrs. v. Schlagintweit.

81. Barbus polydori.

Cuv. & Val. xvi. p. 170.

D. 12. A. 7. L. lat. 27.

The osseous dorsal ray is slender, and very finely serrated. Profile of the back convex. Coloration uniform. (*Val.*)

Bombay.

82. Barbus platysoma.

Barbus platysoma, *Bleek. Nat. Tydschr. Ned. Ind.* ix. p. 404.

Systomus } Puntius } (Barbodes) platysoma, *Bleek. Prodr. Cypr.* p. 336; or *Atl. Ichth. Cypr.* p. 100, tab. 30. fig. 2.

D. 11. A. 8. L. lat. 26. L. transv. 7/5.

The osseous dorsal ray is strong, and coarsely serrated behind, its stiff portion being as long as the head, without snout. There are three and a half series of scales between the lateral line and the root of the ventral fin. Body strongly compressed, much elevated, as in *Leuciscus erythrophthalmus*, with the profile of the back much arched; its depth is contained once and three-fourths in the total length (without caudal); head of moderate size, its length being a little more than one-fourth of the total (without caudal); snout short, obtuse, a little shorter than the diameter of the eye, which is one-fourth of the length of the head; barbels not much longer than the eye. The origin of the dorsal fin is behind that of the ventrals, and nearer to the root of the caudal than to the end of the snout. Coloration uniform.

Java.

a. Type of the species. Surakarta. From Dr. Bleeker's Collection.

83. Barbus fasciatus.

Barbus fasciatus, *Bleek. Nat. Tydschr. Ned. Ind.* v. p. 190.

Systomus } Puntius } (Barbodes) fasciatus, *Bleek. Prodr. Cypr.* p. 344; or *Atl. Ichthyol. Cypr.* p. 103, tab. 38. fig. 1.

D. 11. A. 7. L. lat. 26. L. transv. $4\frac{1}{2}/4\frac{1}{2}$.

The osseous dorsal ray is very feeble and finely serrated behind. There are two series of scales between the lateral line and the root of the ventral fin. Body compressed, oblong, with the profile of the back nearly straight; its depth is one-third, or rather less than one-third, of the total length (without caudal); the length of the head is contained thrice and three-fourths in it; snout rather short, somewhat pointed, rather shorter than the diameter of the eye, which is one-third of the length of the head: barbels well developed, much longer than the eye. The origin of the dorsal fin is opposite to that of the ventrals, and midway between the end of the snout and the root of the caudal. Body with narrow brown longitudinal bands,—one along, two or three above, and two below the lateral line.

Sumatra, Banka, Borneo.

a. Type of the species. From Dr. Bleeker's Collection.

84. Barbus maculatus.

Barbus maculatus, (*Kuhl & v. Hass.*) *Cuv. & Val.* xvi. p. 195.
—— binotatus, (*Kuhl*) *Cuv. & Val.* xvi. p. 168; *Bleek. Nat. Tydschr. Ned. Ind.* ix. p. 408.
—— oresigenes, *Bleek. Verh. Bat. Genootsch.* xxiii. *Oost-Java*, p. 17.
—— blitonensis, *Bleek. Nat. Tydschr. Ned. Ind.* iii. p. 96.
—— kusanensis, *Bleek. l. c.* p. 429.
—— polyspilos, *Bleek. l. c.* xiii. p. 352.
Systomus (Barbodes) maculatus, *Bleek. Prodr. Cypr.* p. 347.
Puntius (Barbodes) maculatus, *Bleek. Atl. Ichth. Cypr.* p. 104, tab. 33 (not 34). fig. 1, tab. 40. fig. 1, tab. 43. fig. 6; *Kner, Novara, Fische*, p. 346.

D. 12. A. 8. L. lat. 23–25. L. transv. $\frac{4\frac{1}{2}}{5}$. Vert. 17/13.

The osseous dorsal ray is rather strong, its stiff portion being as long as the head, without snout; its serrature is very conspicuous though rather fine. There are two and a half longitudinal series of scales between the lateral line and the root of the ventral fin. Body strongly compressed, somewhat elevated, as in *Leuciscus rutilus*, with the profile of the back arched; its depth is two-fifths or one-third of the total length (without caudal); head of moderate size, its length being contained twice and three-fifths in the total (without caudal); snout short, but somewhat pointed, as long as the diameter of the eye, which is more than one-fourth of the length of the head; barbels well developed, much longer than the eye. The origin of the dorsal fin is somewhat behind the vertical from that of the ventrals, and midway between the end of the snout and the root of the caudal. Generally with a small blackish spot at the base of the anterior dorsal rays, and with another, less distinct, on the middle of the root of the caudal.

East-Indian archipelago.

a–h. Adult (4–6 inches long). Purchased of Mr. Frank.
i. Adult. From Dr. Bleeker's Collection.
k. Young. Purchased of Mr. Damon.
l. Young. Amboyna. From the Collection of Mad. Ida Pfeiffer.
m. Adult: skeleton. Purchased of Mr. Frank.

85. **Barbus microps.**

Closely allied to *B. maculatus,* but with the eye much smaller, and the snout longer.

D. 11. A. 8. L. lat. 22. L. transv. $4\frac{1}{2}/4\frac{1}{2}$.

The osseous dorsal ray is rather strong, its stiff portion being as long as the postorbital portion of the head; its serrature is very conspicuous though fine. There are two longitudinal series of scales between the lateral line and the root of the ventral fin. Body strongly compressed, somewhat elongate, with the profile of the back slightly arched; its depth is a little less than one-third of the total length (without caudal); snout of moderate length, somewhat pointed, longer than the eye, which is one-fifth of the length of the head; barbels well developed, much longer than the eye. The origin of the dorsal fin is somewhat behind the vertical from that of the ventrals, and midway between the end of the snout and the root of the caudal, or somewhat nearer to the latter. A small blackish spot on the root of the anterior dorsal rays, and another on the middle of the root of the caudal, both spots being sometimes absent.

East-Indian archipelago.

a–e. Two, four, and five inches long. Java (?). Purchased of Mr. Frank.

86. **Barbus goniosoma.**

Systomus | Puntius } (Barbodes) goniosoma, *Bleek. Prodr. Cypr.* p. 349; or *Atl. Ichth. Cypr.* p. 105, tab. 31. fig. 1.

D. 12. A. 8. L. lat. 23. L. transv. $4\frac{1}{2}/4$.

The osseous dorsal ray is rather strong, its stiff portion being as long as the head, without snout; its serrature is conspicuous though fine. There are two longitudinal series of scales between the lateral line and the root of the ventral fin. Body strongly compressed, somewhat elevated, with the profile of the back ascending in a straight line; its depth is contained twice and three-fifths in the total length (without caudal); head of moderate size, its length being rather more than one-fourth of the total (without caudal); snout somewhat pointed, rather longer than the eye, which is one-fourth of the length of the head; barbels well developed, much longer than the eye. The origin of the dorsal fin is behind the insertion of the ventrals, and midway between the front margin of the orbit and the root of the caudal. Coloration uniform.

Sumatra.

a. Type of the species. Benkulen. From Dr. Bleeker's Collection.

87. **Barbus tetrazona.**

Barbus tetrazona, *Bleek. Act. Soc. Sc. Indo-Neerl.* ii. *Borneo,* p. 14.

Systomus | Puntius } (Barbodes) tetrazona, *Bleek. Prodr. Cypr.* p. 341; or *Atl. Ichth. Cypr.* p. 102, tab. 43. fig. 7.

D. 12. A. 8. L. lat. 23. L. transv. $4\frac{1}{2}/4$.

The osseous dorsal ray is of moderate strength and finely serrated behind, its stiff portion being two-thirds as long as the head. There are three series of scales between the lateral line and the root of the ventral fin. Body strongly compressed, somewhat elevated, as in *Leuciscus rutilus*, with the profile of the back arched; its depth is two-fifths of the total length (without caudal), the length of the head being contained in it thrice and two-thirds; snout short, obtuse, much shorter than the diameter of the eye, which is more than a third of the length of the head; barbels of moderate length, scarcely shorter than the eye. The origin of the dorsal fin is opposite to that of the ventrals, and midway between the end of the snout and the root of the caudal. Body with four broad blackish violet cross bands edged with yellow—the first from the nape to behind the pectoral, the second from below the dorsal to below the lateral line, the third across the tail to the middle of the base of the anal, and the fourth (which is the narrowest) across the middle of the free portion of the tail.

Borneo.

a. Two inches long. River Kahajan. From Dr. Bleeker's Collection.—Type of the species.

88. Barbus lateristriga.

Barbus lateristriga, *Cuv. & Val.* xvi. p. 161; *Bleek. Nat. Tydschr. Ned. Ind.* iii. p. 95.

Systomus / Puntius } (Barbodes) lateristriga, *Bleek. Prodr. Cypr.* p. 342; or *Atl. Ichthyol. Cypr.* p. 102, tab. 32. fig. 2.

D. 11. A. 8. L. lat. 23. L. transv. 4½/4.

The osseous dorsal ray is rather stout, finely serrated behind, scarcely half as long as the head. There are two and a half longitudinal series of scales between the lateral line and the root of the ventrals. Body moderately compressed, elevated, its depth being contained from twice and two-thirds to twice and one-fourth in the total length (without caudal). The upper profile is arched on the nape, and concave on the occiput. Head thick, flat above, its length being contained from thrice and two-fifths to four times and one-third in the total (without caudal); eye small, situated immediately below the upper profile, one-fifth of the length of the head; snout obtuse, much longer than the eye; barbels well developed, as long as the snout. *Dorsal fin longer than high*; its origin is in front of that of the ventrals, and midway between the end of the snout and the root of the caudal. A blackish blotch above the opercle; a broad band descends from the middle of the back towards the pectoral fin, terminating in a horizontal band which does not reach the second cross band; the latter descends from below the dorsal fin to the lateral line, where it tapers and terminates; a longitudinal band runs along the middle of the tail and caudal fin.

East-Indian archipelago.

a. Adult. From Dr. Bleeker's Collection.

89. Barbus amblyrhynchus.

Barbus obtusirostris, *Bleek. Nat. Tydschr. Nederl. Ind.* xiv. p. 355 (not *K. & v. H.*).
Systomus (Barbodes) obtusirostris, *Bleek. Prodr. Cypr.* p. 345.
Puntius (Barbodes) amblyrhynchus, *Bleek. Atl. Ichthyol. Cypr.* p. 104, tab. 43. fig. 5.

D. 11. A. 7. L. lat. 23. L. transv. 4½/4.

The osseous dorsal ray is of moderate strength and finely serrated behind. There are two series of scales between the lateral line and the root of the ventral fin. Body strongly compressed, oblong, with the profile of the back slightly arched; its depth is contained thrice and one-third in the total length (without caudal), the length of the head thrice and three-fourths; snout very short and obtuse, much shorter than the diameter of the eye, which is one-third of the length of the head; barbels not shorter than the eye. The origin of the dorsal fin is opposite that of the ventrals, and rather nearer to the root of the caudal than to the end of the snout. Coloration uniform.

Java.

a. Type of the species, 1¾ inch long. Tjambea. From Dr. Bleeker's Collection.

Although this fish probably belongs to a really distinct species, it is young, and ought never have been made the type of a species. Of course, older examples will materially differ from the young one, and it will be difficult to recognize their specific identity, even to those who may compare the typical example. The description of such a species is rather a disadvantage to science than a progress in our knowledge.

bb. *The third dorsal ray is strong, but smooth.*

90. Barbus micropogon.

? *Cuv. & Val.* xvi. p. 188.

D. 11. A. 8. L. lat. 38. L. transv. 4½/5.

The osseous dorsal ray is very strong, smooth, its stiff portion being three-fifths as long as the head. There are two and a half series of scales between the lateral line and the root of the ventral fin. Lips thin, the lower with the transverse fold interrupted in the middle; barbels small. Head and body elongate; the length of the head equals the height of the body, and is one-fifth, or rather less than one-fifth, of the total (without caudal); snout rather produced, obtusely conical; mouth inferior. The origin of the dorsal fin is nearly opposite to the root of the ventrals, and midway between the end of the snout and the root of the caudal. Caudal fin deeply forked. Pectoral much shorter than the head, terminating, in adult examples, at a distance from the ventrals equal to its own length.

Mysore?

a. Stuffed, 30 inches long. India. From the Collection of the East-India Company.

91. Barbus conirostris.

? Barbus gracilis, *Jerdon, Madr. Journ. Lit. & Sc.* xv. 1849, p. 313 (not Capoëta gracilis, *Schleg.*).
Puntius gracilis, *Day, Proc. Zool. Soc.* 1867, p. 290.

D. 4/9. A. 8. V. 10. L. lat. 40. L. transv. 7/7.

Osseous dorsal ray very strong and smooth; its stiff portion is longer than the head. Snout conically pointed. There are three longitudinal series of scales between the lateral line and the root of the ventral. Body oblong, compressed, profile of the back arched; its height is contained thrice and one-third in the total length (without caudal), the length of the head is one-fourth of the same; the greatest depth of the head is two-thirds of its length; the diameter of the eye is contained thrice and two-thirds in the length of the head, and less than that of the snout; barbels longer than the eye, especially the lower; lower lip without anterior fold, and with the posterior interrupted in the middle. Height of dorsal fin at least equal to the depth of the body; its commencement is a little anterior to the ventral, and midway between the end of the snout and the root of the caudal. Caudal fin deeply forked; the pectoral extends nearly to the root of the ventral. Uniform silvery.

Nilgherries.

a–b. Adult (0·16 millim. long) and young. Bowany River.

We have received these specimens from Mr. Day under the denomination given by Mr. Jerdon to a Barbel from Southern India; otherwise I should not have been able to recognize it from the description given by the latter gentleman.

92. Barbus dubius.

Puntius (Barbodes) dubius, *Day, Proc. Zool. Soc.* 1867, p. 291.

D 4/9. A. 8. L. lat. 42. L. transv. 9/?.

Extremely similar to the last species, of which it may be only a sexual difference. Barbels shorter, both pairs of equal length and only half as long as the eye. (*Day.*)

Bowany River.

93. Barbus chilinoides.

Barbus cheilynoides, *M'Clell. Ind. Cypr.* p. 340, tab. 57. fig. 5 (very bad).
Labeobarbus mosal (!), *Steindachner, Sitzgsber. Ak. Wiss. Wien*, lvi. p. , taf. 3.

D. 11. A. 7. L. lat. 32–35. L. transv. 5½/5.

The osseous dorsal ray is very strong, smooth, its stiff portion being about three-fifths as long as the head. There are three series of scales between the lateral line and the root of the ventral fin. The length of the head is one-fourth of the total (without caudal); it is rather low, its depth being equal to its length, without snout; snout moderately produced, somewhat pointed; mouth inferior, lips thickish, the lower without lobe, but with a continuous transverse fold in front and behind. Body rather low, compressed, its depth being two-ninths of the total length (without caudal). Caudal deeply forked. Each scale on the upper half of the body with a dark margin.

Himalayas. (The typical specimens were from Simla.) Ganges.

a–b. Fine specimens, 8 inches long. Kamaon, Himalaya. From the Collection of Messrs. von Schlagintweit.

c. Four inches long. Ganges. From Dr. M'Clelland's Collection.

d. Half-grown: stuffed. India. Purchased of Mr. Warwick.

94. **Barbus deauratus.**

Cuv. & Val. xvi. p. 188.

D. 11. A. 7. L. lat. 29.

The osseous dorsal ray is slender and smooth. Snout obtuse, fins pointed. Colour that of a Carp, without silvery lateral band. (*Val.*)

Cochinchina; 4½ inches long.

95. **Barbus carnaticus.**

Barbus carnaticus, *Jerdon, Madr. Journ. Lit. & Sc.* xv. p. 311.

Puntius (Barbodes) carnaticus, *Day, Proc. Zool. Soc.* 1867, p. 292.

D. 12. A. 8–9. L. lat. 25–29. L. transv. $4\frac{1}{2}/4\frac{1}{2}$.

The osseous dorsal ray is strong, smooth, as long as the head, without snout. There are two and a half longitudinal series of scales between the lateral line and the root of the ventral fin. Body compressed, oblong; its depth is one-third of the total length (without caudal), the length of the head two-ninths; snout of moderate length, longer than the eye, which is one-fourth of the length of the head; interorbital space flat; upper jaw slightly overlapping the lower; the anterior barbel is a little shorter than the posterior, which is as long as the eye. Dorsal fin considerably lower than the body; its origin is in front of that of the ventral, and conspicuously nearer to the end of the snout than to the root of the caudal. Anal fin extending to the root of the caudal when laid backwards. Fork of the caudal fin of moderate depth, the middle rays being not quite half as long as the outer longest ones. Uniform silvery, the outer half of the fins blackish.

Cavery River.

a–b. Nine inches long. Presented by Captain Mitchell.

c–d. Young. Bowany River. Presented by Mr. Day.

cc. *The third dorsal ray is not enlarged.*

96. **Barbus spinulosus.**

M'Clell. Calc. Journ. Nat. Hist. v. 1845, p. 280, pl. 21. fig. 3 (bad)

D. 12. A. 7. L. lat. 32.

No osseous dorsal ray. The height of the body is nearly equal to the length of the head, which is one-fourth of the total (without caudal). Eyes before the middle of the length of the head. Dorsal profile but little arched, and the dorsal fin commences midway between the end of the snout and commencement of the caudal. Snout short. Coloration uniform. (*M'Cl.*)

Sikkim.

97. Barbus gobioformis.

Pachystomus (?) gobioformis, *Kner, Novara, Fische,* p. 353, taf. 15. fig. 4.

D. 10. A. 8. V. 8. L. lat. 36–38. L. transv. $\frac{6}{7}$.

Dorsal fin without enlarged osseous ray. There are four longitudinal series of scales between the lateral line and ventral fin. The height of the body is equal to the length of the head, which is nearly one-fourth of the total (without caudal); snout of moderate length, longer than the eye; lower barbel longer than the upper, which is about as long as the eye. The origin of the dorsal fin is a little behind that of the ventrals, and somewhat nearer to the root of the caudal than to the end of the snout. A series of dark round spots along the lateral line, confluent on the anterior part of the body; dorsal fin crossed by an oblique dark band. (*Kner.*)

Said to be from Java, but evidently allied to the East Asiatic types of *Barbus.*

C. *Scales large: three and a half longitudinal series between the lateral line and the origin of the dorsal fin.*

1. *Indian.*

a. *The third dorsal ray is enlarged and smooth.*

98. Barbus hexastichus.

Lobura or Bokar (Assam).

Barbus hexastichus, *M'Clell. Ind. Cyprin.* p. 333, tab. 39. fig. 2 (not synon.).

—— hexagonolepis, *M'Clell. l. c.* p. 336, tab. 41. fig. 3 (very bad).

D. 12. A. 7–8. L. lat. 24–27. L. transv. $3\frac{1}{2}/4$.

The osseous ray is very strong, smooth, about two-thirds as long as the head, which is small, short, two-ninths of the total length (without caudal). There are two series of scales between the lateral line and the root of the ventral fin. Lips moderately thick, lower lip without lobe, with a continuous transverse fold; mouth inferior. Body moderately compressed, elongate, its depth being one-fourth of the total length (without caudal); snout short and obtuse; operculum much higher than long; interorbital space very convex. Caudal deeply forked.

Rivers of the southern slope of the Himalayas.

a, b–c. Half-grown and young. Nepal. Presented by B. H. Hodgson, Esq.

d–e. Young. Sikkim. From the Collection of Messrs. von Schlagintweit.

f. Young: skin. Himalayas.

g–h. Nineteen and eighteen inches long: stuffed. Scharunpore. From Griffith's Collection.

i–l. Adult: stuffed. India.
m. Young. Delhi. From the Collection of Messrs. von Schlagintweit.

99. **Barbus soro.**

Barbus soro, *Cuv. & Val.* xvi. p. 191; *Bleek. Nat. Tydschr. Nederl. Ind.* viii. p. 90.
Labeobarbus soro, *Bleek. Prodr. Cypr.* p. 390, and *Atl. Ichthyol. Cypr.* p. 79, pl. 20. fig. 2.

Scarcely distinct from *B. hexastichus*, but with the interorbital space flat.

D. 12. A. 8. L. lat. 26–38. L. transv. 3½/4.

The osseous ray is very strong, smooth, one-half or two-thirds as long as the head, the length of which is contained from thrice and three-fourths to four times and a half in the total (without caudal). There are two series of scales between the lateral line and the root of the ventral fin. Lips moderately thick, lower lip without lobe, but with a continuous transverse fold; mouth inferior. Body compressed, rather elongate, its depth being two-sevenths of the total length (without caudal); snout of moderate length; operculum much higher than long. Origin of the dorsal fin nearly midway between the end of the snout and the root of the caudal. Caudal fin deeply forked.

Java and Sumatra.

a. Young. From Dr. Bleeker's Collection.
b. Half-grown. East Indies. Purchased of Mr. Damon.

100. **Barbus mosal.**

Mahaseer, Mahasaula. Jungha (Assam).
Cyprinus mosal, *Ham. Buch. Fish. Gang.* pp. 306, 388; *Gray & Hardw. Ind. Zool.* pl.
—— tor, *Ham. Buch. l. c.* pp. 305, 388.
Tor hamiltonii, *Gray & Hardw. Ind. Zool.* pl.
Barbus khudree, *Sykes, Trans. Zool. Soc.* ii. p. 357.
Barbus megalepis, *M'Clell. Ind. Cyprin.* p. 337.
Barbus progeneius, *M'Clell. Ind. Cypr.* p. 334, tab. 56. fig. 3.
? Barbus (Labeobarbus) hamiltonii, *Jerdon, Madr. Journ. Lit. & Sc.* xv. 1849, p. 311.

D. 12. A. 7–8. L. lat. 25–27. L. transv. 3½–4/4.

The osseous dorsal ray is strong, smooth, its stiff portion being nearly half as long as the head, which is much elongate, two-sevenths of the total length (without caudal). There are two series of scales between the lateral line and the root of the ventral fin. Lips more or less fleshy, with or without lobes; body moderately compressed, elongate, its depth being one-fourth, or rather less than one-fourth, of the total length (without caudal); snout produced, pointed; operculum not much higher than long. Caudal deeply forked.

Mountain-streams south of the Himalayas and Hindoo Koosh.

a–b. Forty and twenty-eight inches long: stuffed. Nepal. Presented by B. H. Hodgson, Esq.
c. Young: skin. Eerki, Himalaya. From Griffith's Collection.
d–e. Young: stuffed. Himalayas.
f. Young. Jamu, Himalayas. From the Collection of Messrs. von Schlagintweit.
g. Thirty-eight inches long: stuffed. Northern India. From the Collection of the East-India Company.
h. Head of young. Malva, Central India. From the Collection of Messrs. von Schlagintweit.
i. Twenty-three inches long: stuffed. Seharunpore. From Griffith's Collection.
k. Young: in bad state. Dekkan. From Col. Sykes's Collection.
l. Half-grown: stuffed. From Mr. Wyllie's Collection.
m. Twenty inches long: stuffed. Presented by T. C. Jerdon, Esq.
n. Young: skin. River Chenab. From Griffith's Collection.
o. Young: skin. Beebee Nanee. From Griffith's Collection.
p. Young: skin. Julalabad. From Griffith's Collection.

Cyprinus putitora, Ham. Buch. Fish. Gang. pp. 303 & 388, from Eastern Bengal, has not been sufficiently distinguished from this species. Also M'Clelland describes a fish from China under this name, Calcutt. Journ. Nat. Hist. iv. p. 399, tab. 23. fig. 4.

Hamilton describes *C. tor* as having a "sharpish head," which character is not found in *B. hexastichus* (with which M'Clelland attempted to identify this fish), but in *B. progeneius*.

Also in this species the presence of a lower labial lobe is not constant: it is not developed in young individuals; and as regards old ones, it is longer in some than in others.

101. Barbus macrocephalus.

Burapetea (Assam).
Barbus macrocephalus, *M'Clell. Ind. Cypr.* p. 335, tab. 55. fig. 2 (bad).

This is at present a very doubtful species, evidently closely allied to *B. mosal*, but said to be distinguished by a very large head, the length of which is two-fifths only of the total (without caudal). L. lat. 27. Lips not thickened, without lobes; mouth anterior (?).

Assam.

102. Barbus macrolepis.

Labeobarbus macrolepis, *Heckel, Fische aus Caschmir*, p. 60, taf. 10. fig. 2.

Evidently closely allied to *B. mosal*.

D. 12. A. 7. L. lat. 27. L. transv. $3\frac{1}{2}/3\frac{1}{2}$.

The osseous dorsal ray is of moderate strength and smooth. There are two longitudinal series of scales between the lateral line and the root of the ventral fin. The height of the body is somewhat more than one-fourth of the total length (without caudal), the length of the head two-sevenths; snout of moderate length; lips fleshy, the lower with a lobe. Operculum much higher than long. Fork of the caudal fin of moderate depth. (*Heck.*)

Kashmeer.

103. Barbus tambra.

Barbus tambra, *Cuv. & Val.* xvi. p. 190.

Labeobarbus tambra, *Bleek. Nat. Tydschr. Ned. Ind.* xiii. p. 355, or *Prodr. Cypr.* p. 389; *Atl. Ichthyol. Cypr.* p. 78, tab. 22. fig. 2.

D. 12–13. A. 8. L. lat. 22–23. L. transv. $3\frac{1}{2}$–$3\frac{1}{2}$:

The osseous dorsal ray is rather feeble, its stiff portion being not quite half as long as the head, the length of which equals the depth of the body, and is one-fourth or somewhat more than one-fourth of the total length (without caudal). There are two series of scales between the lateral line and the root of the ventral. Head moderately elongate, its greatest height being equal to its length, without snout; operculum only two-thirds as long as high. Snout of moderate length, obtusely conical, with thick lips, the lower having a broad, well-developed lobe; mouth inferior. Origin of the dorsal fin nearly midway between the end of the snout and the root of the caudal. Caudal fin deeply forked.

Java.

a. Eighteen inches long. From Dr. Bleeker's Collection.

104. Barbus douronensis.

Barbus douronensis, *Cuv. & Val.* xvi. p. 187 (young); *Bleek. Nat. Tydschr. Ned. Ind.* vii. p. 91.

Labeobarbus douronensis, *Bleek. Prodr. Cypr.* p. 392, and *Atl. Ichthyol. Cypr.* p. 79, tab. 21. fig. 2.

D. 12. A. 8. L. lat. 21–23. L. transv. $3\frac{1}{2}$/4.

The osseous dorsal ray is rather strong, smooth, as long as the head, without snout. There are one and a half series of scales between the lateral line and the root of the ventral fin. Lips moderately thick, the lower with a more or less distinct indication of a lobe; mouth inferior. The length of the head is one-fourth of the total (without caudal), the height of the body one-third. Body compressed, scarcely elongate (except in young examples), with the back below the origin of the dorsal somewhat elevated. Snout of moderate length. Origin of the dorsal fin midway between the end of the snout and the root of the caudal. Caudal fin deeply forked.

Sumatra; Java; Borneo.

a. Eight inches long. From Dr. Bleeker's Collection.

b–d. Young. Purchased of Mr. Frank.

105. Barbus longispinis.

Labeobarbus tor, *Bleek. Cobit. & Cypr. Ceyl., in Nat. Verhandl. Holl. Maatsch. Harlem,* 1864, p. 10, tab. 2 (not synon.).

Closely allied to *B. douronensis,* but with a longer and stronger osseous dorsal ray.

D. 12. A. 8. L. lat. 24. L. transv. $3\frac{1}{2}$/$3\frac{1}{2}$.

The osseous dorsal ray is very strong, smooth, its stiff portion being as long as the head, the length of which is one-fourth, or a little more than one-fourth, of the total length (without caudal). There are two, or one and a half, series of scales between the lateral line and the root of the ventral fin. Lips moderately thick, lower lip with an indication of a lobe; mouth inferior. Body compressed, rather elongate, with the back below the origin of the dorsal somewhat elevated; its depth is contained thrice and one fourth in the total length (without caudal). Snout of moderate length. Origin of the dorsal fin midway between the end of the snout and the root of the caudal. Caudal fin deeply forked.

Ceylon.

a, b–c, d–e, f–h. From 4 to 11 inches long. Ceylon. From Mr. Cuming's Collection.

106. Barbus tambroides.

Labeobarbus tambroides, *Bleek. Nat. Tydschr. Ned. Ind.* vii. p. 22, or *Prodr. Cypr.* p. 386; *Atl. Ichthyol. Cypr.* p. 77, tab. 23.

D. 12. A. 8. L. lat. 22–23*. L. transv. $3\frac{1}{2}/4\frac{1}{2}$.

The osseous dorsal ray is strong, smooth, its stiff portion being as long as the head, without snout. The length of the head is contained thrice and two-thirds in the total (without caudal), the height of the body thrice, or thrice and one-fourth. There are two series of scales between the lateral line and the root of the ventral fin. Lips very thick, both with well-developed lobes; mouth inferior. Body compressed, with the profile of the back curved. Snout of moderate length. Origin of the dorsal fin a little nearer to the root of the caudal than to the end of the snout. Caudal fin deeply forked.

Java and Sumatra.

a. One of the typical specimens. From Dr. Bleeker's Collection.

b. *No osseous dorsal ray.*

107. Barbus arulius.

Systomus arulius, *Jerdon, Madr. Journ. Lit. & Sc.* xv. 1849, p. 317
Labeo melanampyx, *Day, Proc. Zool. Soc.* 1865, p. 298.
Puntius melanampyx, *Day, Fish. Malab.* p. 210, pl. 16. fig. 1.
—— grayi, *Day, Proc. Zool. Soc.* 1867, p. 293.
—— arulius, *Day, l. c.* p. 294.

D. 11. A. 7. L. lat. 19–20. L. transv. $3\frac{1}{2}/3\frac{1}{2}$.

No osseous dorsal ray. Two longitudinal series of scales between the lateral line and the root of the ventral Shape of body as in a young Carp. The height of the body is contained twice and three-fifths in the total length (without caudal), the length of the head thrice and a half. Snout of moderate length, as long as, or rather longer than, the eye, which is two-sevenths of the length of the head; barbels well developed, the lower half as long as the head. Dorsal fin scarcely higher than long; its origin is a little in front of the vertical from that of the ventrals, and midway between the end of the snout and root of the caudal fin. Body with three black cross bands—the first, rather irregular, across the occiput, the second from and from before the anterior dorsal rays to the root of the ventral, the third across the tail, behind the dorsal and above the anterior anal rays. Sometimes the bands are indicated only by the reticulated black margins of the scales (*P. grayi*).

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* 24–26 according to Bleeker.

Hill-ranges of Travancore; Nilgherries.

a. One of the typical specimens of *B. melanampyx*. Travancore. Presented by Surgeon Day.
b. Adult. Travancore. From Dr. Bleeker's Collection.
c–e. Half-grown. Nilgherries. Presented by Surgeon Day.
f–h. Typical specimens of *P. grayi*. Nilgherries. Presented by Surgeon Day.

2. *African.*

108. Barbus camptacanthus.

Puntius (Barbodes) camptacanthus, *Bleek. Poiss. Côte de Guinée, in Mém. Soc. Holl. Harlem*, 1862, p. 111, tab. 23. fig. 2.
—— (——) ablabes, *Bleek. l. c.* p. 114, tab. 23. fig. 1.
Enteromius potamogalis, *Cope, Journ. Ac. Nat. Sc. Philad.* 1866, p. 405.

D. 11. A. 7. L. lat. 21–23 L. transv. $3\frac{1}{2}/4$. Vert. 18/16.

No osseous dorsal ray. Two and a half longitudinal series of scales between the lateral line and the root of the ventral. Body rather oblong, its depth being one third of the total length (without caudal; head of moderate size, one-fourth of the total (without caudal); snout of moderate length, much longer than the eye, which is small, two-ninths or one-fifth of the length of the head; barbels moderately long, longer than the eye; præ- and suborbital region with numerous pores. Dorsal fin higher than long; its origin is opposite to that of the ventrals and rather nearer to the end of the snout than to the root of the ventrals. A narrow blackish band runs along the middle of the side, and somewhat widens behind; indistinct streaks along the upper series of scales.

West Africa.

a, b. Fine adult specimens. Niger Expedition.
c–e. Half-grown. Niger Expedition.
f. Adult. River Bonny. Purchased of Mr. J. Wood.
g. Half-grown. Presented by the Royal College of Surgeons.
h. Adult male: skeleton. River Bonny. Purchased of Mr. J. Wood.

109. Barbus radiatus.

Peters, MS.

D. 11. A. 8. L. lat. 26. L. transv. $3\frac{1}{2}/3$.

No osseous dorsal ray. There are two longitudinal series of scales between the lateral line and the root of the ventral. Body oblong, its height is equal to the length of the head and contained thrice and two-thirds in the total length (without caudal). Snout obtuse; eye large. Dorsal fin elevated, commencing opposite the root of the ventral, but slightly nearer to the end of the snout than to the root of the caudal. Anal rather narrow and deep. Caudal deeply forked.

Mozambique.

I know this fish (which has quite the appearance of being young) from a drawing only, not quite 2 inches long, and kindly communicated to me by Prof. Peters.

II. *Normally two barbels.*

A. *L. lat.* 48–55.

110. **Barbus schlegelii.**

Gobio barbus, *Schleg. Faun. Japon. Poiss.* p. 198, pl. 99. fig. 1.
Hemibarbus barbus, *Bleek. Prodr. Cypr.* p. 281 (name only).

D. 10. A. 9. L. lat. 48. L. transv. 7/7.

The osseous dorsal ray is strong, smooth, its stiff portion being longer than the head, without snout. There are four longitudinal series of scales between the lateral line and the ventral fin. Head and body elongate; the length of the head is contained thrice and three-fourths in the total (without caudal); snout produced, nearly twice as long as the diameter of the eye, which is two-ninths of the length of the head in a specimen 9 inches long; upper jaw protruding beyond the lower; lips thick, the lower dilated into a pendent flap on each side; barbel as long as the eye. The origin of the dorsal is in advance of that of the ventral, and nearer to the end of the snout than to the root of the caudal. Anal fin rather deep. Coloration uniform.

Japan; Formosa.

a–b. Nine and six inches long. Formosa. From Consul Swinhoe's Collection.

The pharyngeal teeth are arranged in three series, as normally in this genus, and not uniserial as stated by Schlegel and Bleeker in Prodr. Cypr. p. 267,—genus *Hemibarbus* of Bleeker. In the Atlas Ichthyol. Cypr. p. 27, this author maintains this genus, referring it to the "*Barbi*" with triserial teeth; but the characters "rostrum non vel vix prominens; labia teretia non lobata" might be modified into "rostrum prominens; labia dilatata."

111. **Barbus cetopsis.**

Labeo cetopsis, *Kner, Novara, Fische,* p. 351, taf. 15. fig. 2.

D. 10. A. 8. V. 8. L. lat. 55. L. transv. 7/?.

Dorsal fin without enlarged osseous ray. There are six (and a half) longitudinal series of scales between the lateral line and ventral fin. Head and body elongate; the length of the head is nearly one-fifth of the total (without caudal); snout produced, not quite twice as long as the orbit, which is one-fifth of the length of the head; upper jaw swollen, protruding beyond the lower; lips thick, the lower dilated into a pendent flap on each side; barbel as long as the postorbital part of the head. The origin of the dorsal fin is considerably in advance of the ventral, and nearly equidistant between the end of the snout and the end of the anal. Coloration uniform. (*Kner.*)

Shanghai.

B. *L. lat.* 34–40.

1. *No osseous dorsal ray* (Gonoproktopterus *et* Gnathopogon, *Blkr.*).

112. Barbus kolus.

Barbus kolus, *Sykes, Trans. Zool. Soc.* ii. p. 357, tab. 62. fig. 1.
Hypselobarbus (Gonoproktopterus) kolus, *Bleek. Prodr. Cypr.* p. 275 (name only).

D. 12. A. 8. L. lat. 40. L. transv. 11/8.

The dorsal fin is without osseous ray. There are four longitudinal series of scales between the lateral line and the root of the ventral fin. Body compressed, oblong; its depth is contained thrice and three-fourths in the total length (without caudal), the length of the head four times and one-fourth. Snout of moderate length, a little longer than the eye, which is two-sevenths of the length of the head; interorbital space scarcely convex, the upper profile of the head being gently and regularly curved from the back to the end of the snout; upper jaw overlapping the lower; barbel shorter than the eye. Dorsal fin lower than the body; its origin is distinctly anterior to that of the ventral and much nearer to the end of the snout than to the root of the caudal. Anal fin rather deep and narrow. Coloration uniform silvery. Adult specimens (12 inches long) with tubercles on the præorbital region.

Poonah.

a. Five and a half inches long. From Dr. Cantor's Collection.
b. Half-grown. Poonah. Presented by Lieut.-Col. Playfair.
c–e. Adult: skins. Poonah. Presented by Lieut.-Col. Playfair.

113. Barbus homogenes.

Capoëta elongata, *Schleg. Faun. Japon. Poiss.* p. 200, pl. 100. fig. 1 (not *Barbus elongatus*, Rüpp.).

D. 10. A. 8. L. lat. 38. L. transv. 5/7.

Dorsal fin without osseous ray. The height of the body is rather more than the length of the head, which is one-fourth of the total (without caudal). Snout as long as the diameter of the eye, which is one-fourth of the length of the head. Jaws even anteriorly; maxillary scarcely reaching to the vertical from the orbit; barbels two, shorter than the eye. The origin of the dorsal fin is a little in advance of the ventral, and somewhat nearer to the end of the snout than to the root of the caudal. Anal fin moderately deep. An indistinct bluish silvery band along the middle of the body. (*Schleg.*)

Japan.

114. Barbus homozonus.

Capoëta gracilis, *Schleg. Faun. Japon. Poiss.* p. 201, pl. 100. fig. 2 (not *Barbus gracilis*, Jerdon).

D. 10. A. 8. L. lat. 35. L. transv. 4/5.

Dorsal fin without osseous ray. The height of the body is nearly equal to the length of the head, which is one-fourth of the total (without caudal). Snout a little shorter than the diameter of the eye, which is more than one-fourth of the length of the head. Jaws nearly even anteriorly; maxillary scarcely reaching to the vertical from the orbit; barbels two, shorter than the eye. The origin of the dorsal fin is nearer to the end of the snout than to the root of the caudal. Pectoral long, reaching to the root of the ventral. A bluish silvery band along the side. (*Schleg.*)

Japan. Two and a half inches long.

115. Barbus aphya.

Gnathopogon javanicus, *Bleek. Atl. Ichthyol. Cypr.* p. 117, tab. 2. fig. 9 (not *Barbus javanicus*, Blkr.).

D. 9. A. 8. L. lat. 33–34. L. transv. 3½/4.

Dorsal fin without osseous ray. There are two and a half longitudinal series of scales between the lateral line and the root of the ventral fin. The height of the body is two-ninths of the total length (without caudal), the length of the head one-fourth. Snout as long as the diameter of the eye, which is a little more than one-fourth of the length of the head. Jaws even anteriorly; maxillary scarcely reaching to the vertical from the orbit; barbels two, shorter than the eye. The origin of the dorsal fin is somewhat in advance of the ventrals, and nearly midway between the end of the snout and the root of the caudal. Pectoral fin terminating at some distance from the ventral. A broad silvery band along the middle of the side.

Java.

a. Type of the species, 2⅓ inches long: not in good state. From Dr. Bleeker's Collection.

2. *An osseous dorsal ray; barbels simple.*

116. Barbus siaja.

Capoëta enoplos, *Bleek. Nat. Tydschr. Ned. Ind.* ii. p. 431.
—— siaja, *Bleek. l. c.* p. 432.
Cyclocheilichthys (Siaja) siaja, *Bleek. Prodr. Cypr.* p. 374; or *Atl. Ichthyol. Cypr.* p. 86, pl. 29. fig. 3.
—— (Siaja) macropus, *Bleek. Prodr. Cypr.* p. 373; or *Atl. Ichthyol. Cypr.* p. 86, pl. 35. fig. 3.

D. 12. A. 8. L. lat. 37. L. transv. 7/6.

The osseous dorsal ray is very strong, its stiff portion being as long as the head, with coarse and conspicuous serrature. There are four and a half longitudinal series between the lateral line and the root of the ventral fin. Body strongly compressed, elevated, the profile of the back slightly arched; the greatest depth is contained twice and five-sixths in the total length (without caudal); head of moderate size, its length being contained thrice and two-thirds in the total length (without caudal); the length of the snout equals that of the eye, and is one-third of the length of the head. Upper jaw slightly overlapping the lower; barbels very small, one-fourth the length of the eye. The origin of the dorsal fin is midway between the end of the snout and the root of the caudal, and scarcely behind the origin of the ventral. A roundish blackish spot on the end of the lateral line.

Sumatra and Borneo.

See also *Barbus armatus*, p. 111.

a. Type of the species. Sumatra. From Dr. Bleeker's Collection.
b. Type of *C. macropus*. Borneo. From Dr. Bleeker's Collection.
c. Young. East-Indian archipelago. Purchased of Mr. Frank.

117. **Barbus deventeri.**

Capoëta deventeri, *Bleek. Nat. Tydschr. Ned. Ind.* ix. p. 413.
Cyclocheilichthys (Siaja) deventeri, *Bleek. Prodr. Cypr.* p. 375; or *Atl. Ichthyol. Cypr.* p. 87, pl. 37. fig. 3.

D. 12. A. 8. L. lat. 34. L. transv. 5½/5½.

The osseous dorsal ray is of moderate strength and finely serrated. Mouth rather small, with the upper jaw overlapping the lower. Snout as long as the eye. The height of the body is one-third of the total length (without caudal), the length of the head rather more than one-fourth. There are four longitudinal series of scales between the lateral line and the root of the ventral fin. The origin of the dorsal fin is behind the base of the ventral. A round blackish spot on the end of the lateral line.

Java.

a. Type of the species: in a very bad state. Lake Grati. From Dr. Bleeker's Collection.

3. *Barbels fringed.*

118. **Barbus heteronema.**

Barbus heteronema, *Bleek. Nat. Tydschr. Ned. Ind.* v. p. 416.
Cyclocheilichthys (Siaja) heteronema, *Bleek. Prodr.* p. 377; or *Atl. Ichthyol. Cypr.* p. 87, tab. 29. fig. 1.

D. 11. A. 8. L. lat. 34. L. transv. 6½/6½.

Barbels longer than the eye, and divided into long fringes. Dorsal spine of moderate strength, serrated. The height of the body is contained twice and four-fifths in the total length (without caudal), the length of the head thrice and two-thirds. The diameter of the eye is longer than the snout, which is rather obtuse, with the upper jaw slightly overlapping the lower. There are four longitudinal series of scales between the lateral line and the root of the ventral fin. Coloration uniform.

Borneo.

a–f. Two of the typical specimens. Sambas. From Dr. Bleeker's Collection.

C. *L. lat.* 31 *or less.*

1. *Snout without tubercles.*

a. *Mouth extending beyond the vertical from the front margin of the orbit.* (Hampala.)

119. Barbus hampal.

Capoëta macrolepidota, *Cuv. & Val.* xvi. p. 280, pl. 477; *Cant. Mal. Fish.* p. 267; *Bleek. Verh. Bat. Genootsch.* xxiii. *Oost-Java*, p. 21.
Hampala macrolepidota, (*Kuhl & v. Hass.*) *Bleek. Prodr. Cypr.* ii. p. 308; or *Atl. Ichthyol. Cypr.* p. 112, tab. 38. fig. 2.

D. 12. A. 8. L. lat. 28. L. transv. $4\frac{1}{2}/4$.

The osseous dorsal ray is feeble and finely serrated. Mouth wide, extending backwards slightly beyond the vertical from the front margin of the orbit. Snout somewhat pointed, with the jaws equal in length. The height of the body is a little less than the length of the head, which is two-sevenths of the total (without caudal). A more or less distinct black vertical blotch between the dorsal and ventral. Caudal fin with a broad upper and lower margin.

Java; Borneo; Sumatra; Malayan peninsula.

a, b, c, d. Adult and half-grown. East-Indian archipelago.
e. Adult: skin. Pinang. From Dr. Cantor's Collection.
f–g. Half-grown. Siam. Purchased of Mr. Jamrach.

Bleeker quotes Kuhl and Van Hasselt (Algem. Konst- en Letterbode, 1823, ii. p. 132) to establish the priority for the denomination "*Hampala macrolepidota*;" but, although the notice of the *genus Hampala*, superficial as it is, would coincide with, and might supersede, *Capoëta* of Valenciennes, no character whatever is assigned to the *species*, and therefore the description given by Valenciennes is to be regarded as the original, from which the synonymy starts. However, Heckel had named a species of Barbel *macrolepis* several years before. Bleeker's genus *Hampala* is based on the slightly greater extent of the cleft of the mouth, which, however, is scarcely greater than in *B. soro* &c.

120. Barbus ampalong.

Capoëta ampalong, *Bleek. Nat. Tydschr. Ned. Ind.* iii. p. 594.
Hampala ampalong, *Bleek. Prodr. Cypr.* p. 310; or *Atl. Ichthyol. Cypr.* p. 113, tab. 27. fig. 1.

D. 12. A. 8. L. lat. 31. L. transv. $4\frac{1}{2}/4\frac{1}{2}$.

The osseous dorsal ray is slender and finely serrated. Mouth wide, extending backwards slightly beyond the vertical from the front margin of the orbit. Snout somewhat pointed, with the jaws equal in length. The height of the body is somewhat less than the length of the head, which is contained thrice and one-third in the total (without caudal). There are two longitudinal series of scales between the lateral line and the root of the ventral. A roundish black spot above the lateral line, below the anterior dorsal rays; a second on the lateral line, behind the anal.

Borneo and Sumatra.

a. Type of the species. From Dr. Bleeker's Collection.

b. *Mouth narrow.*

a. Asiatic.

aa. *The third dorsal ray is osseous and serrated.*

121. Barbus fasciolatus.

D. 11. A. 8. L. lat. 24. L. transv. 4½/4½.

The osseous dorsal ray is of moderate strength, finely serrated, and three-fifths as long as the head. There are two series of scales between the lateral line and the root of the ventral fin. The height of the body is a little more than one-third of the total length (without caudal), the length of the head two-sevenths. Snout very obtuse, shorter than the diameter of the eye, which is more than two-sevenths of the length of the head, and nearly equal to the width of the interorbital space; barbel very small. Dorsal and anal fins not elevated; the origin of the former is nearly opposite to that of the ventral, and midway between the end of the snout and the root of the caudal. Caudal fin moderately forked. Sides of the body and tail with three or four narrow, black vertical streaks, not extending to the back or belly; a round black spot on the end of the lateral line.

China.

a. One inch and three-quarters long. Purchased of Mr. Warwick.

122. Barbus sumatranus.

Puntius (Capoëta) tetrazona, *Bleek. Nat. Tydschr. Nederl. Ind.* ix. p. 262; or *Prodr. Cypr.* p. 354.

— (——) sumatranus, *Bleek. Atl. Ichth. Cypr.* p. 108, tab. 2. fig. 11.

D. 11. A. 7. L. lat. 21. L. transv. 5½/5.

The osseous dorsal ray is rather feeble, evenly serrated behind, shorter than the head. There are three longitudinal series of scales between the lateral line and the root of the ventral fin. Lateral line incomplete. Snout obtuse; the lower jaw received withinthe upper. Upper profile of the head slightly concave. The height of the body is contained twice and one-fifth in the total (without caudal), the length of the head thrice and a half. Barbels two, minute. Origin of the dorsal fin distinctly behind that of the ventral. Anterior anal ray feeble. Body with four brown cross bands—one through the eye, the second before, the third behind the dorsal, the fourth across the end of the tail. Dorsal and ventral fins nearly entirely black.

Sumatra.

a–b. Typical specimens, 1½ inch long. Lahat. From Dr. Bleeker's Collection.

bb. *The third dorsal ray is osseous and smooth.*

123. **Barbus luteus.**

Systomus luteus, *Heckel, in Russegger's Reisen*, i. p. 1061, taf. 6. fig. 1.
? Systomus albus, *Heckel, l. c.* p. 1063. fig. 2, and ii. 3. p. 257.

D. 14. A. 9. L. lat. 28–30. L. transv. 5/4.

The osseous dorsal ray is of moderate strength, and smooth. Mouth rather small, not extending backwards to the vertical from the front margin of the eye. Snout obtuse, longer than the eye, which is small, about one-sixth of the length of the head, in specimens 6–7 inches long. The height of the body is a little less than one-third of the total length (without caudal), the length of the head two-ninths. There are two and a half longitudinal series of scales between the lateral line and the root of the ventral fin. The dorsal fin commences opposite to the origin of the ventral, midway between the end of the snout and the root of the caudal. Coloration uniform. (*Heck.*)

Orontes and Tigris; ? Rivers and lakes of Persia.

124. **Barbus liacanthus.**

Capoëta javanica, *Bleek. Nat. Tydschr. Nederl. Ind.* ix. p. 412.
Systomus / Puntius } (Capoeta) leiacanthus, *Bleek. Prodr. Cypr.* p. 356; or *Atl. Ichthyol. Cypr.* p. 109, tab. 36. fig. 1.
Systomus amphibius, *Jerdon, Madras Journ. Lit. & Sc.* xv. 1849, p. 315 (not *Cuv. & Val.*).
Puntius parrah, *Day, Proc. Zool. Soc.* 1865, p. 301, and *Fish. of Malabar*, p. 211, tab. 7. fig. 3 (not good).
? Puntius perlee, *Day, l. c.* p. 211.

D. 11. A. 8. L. lat. 24–27. L. transv. 4½/4.

The osseous dorsal ray is of moderate strength, and smooth. Mouth small; barbel shorter than the eye; snout obtuse, not longer than the eye, with the jaws equal in length. The height of the body is contained twice and two-thirds or twice and three-fourths in the total length (without caudal), the length of the head nearly four times; the depth of the head is equal to, or a little more than, its length (without snout). There are three longitudinal series of scales between the lateral line and the root of the ventral. The dorsal fin commences opposite to the origin of the ventral, midway between the end of the snout and the root of the caudal. Silvery, frequently a more or less distinct black spot on the end of the lateral line.

Java; Madras Presidency.

a. One of the typical specimens. Java. From Dr. Bleeker's Collection.
b. Adult. Cochin. Presented by Capt. Mitchell.

c. Half-grown. Malabar. Presented by Mr. Day as one of the types of his *P. perlee*.

Mr. Day, the author of the 'Fishes of Malabar,' has described two Barbels under the names of *Puntius parrah* and *Puntius perlee*, the latter being distinguished by a higher body,—"the height of the body being four-elevenths of its length, excluding the caudal fin," in the former species, and "one-half" in the latter. Typical examples of these two species were presented by him to the British Museum. However, these specimens do not at all agree with the descriptions given. The fish given to us as *P. perlee* agrees much more with the description and figure of *P. parrah* than with that of the species to which the specimen is said to belong. And, again, the fish presented as *P. parrah* cannot be referred to this species, as described by Mr. Day. Beside the very oblong body, its osseous dorsal ray is very feeble, and much less strong than that in *P. parrah*. It is possible that the latter specimen belongs to a distinct species, not recognized by Mr. Day, and which I abstain from describing, having only one apparently immature example ($3\frac{1}{2}$ inches).

125. **Barbus dorsalis.**

Systomus dorsalis, *Jerdon, Madr. Journ. Lit. & Sc.* xv. 1849, p. 314.

D. 11. A. 8. L. lat. 25. L. transv. $4\frac{1}{2}/4$.

The osseous dorsal ray is rather strong, smooth, its stiff portion being as long as the head, without snout. Mouth of moderate width; barbel not longer than the eye. Snout somewhat pointed, its length being more than the diameter of the eye; the upper jaw slightly overlaps the lower. The height of the body is one-third of the total length (without caudal), the length of the head two-sevenths; the depth of the head is more than its length (without snout). There are two longitudinal series of scales between the lateral line and the root of the ventral fin. The dorsal fin commences opposite to the origin of the ventral, and nearly midway between the end of the snout and the root of the caudal. A blackish spot on each side of the hinder part of the base of the dorsal fin.

Madras Presidency.

a. Six and a half inches long. Coruttalai River, near Ponnamullee. Presented by Capt. Mitchell.

b. Half-grown. Ponnay. Presented by Capt. Mitchell.

126. **Barbus tetraspilus.**

Leuciscus binotatus, *Blyth, Journ. As. Soc. Beng.* 1858–59 (not Barbus binotatus, *Kuhl*).

Closely allied to *B. dorsalis*, but with the body more elongate.

D. 11. A. 8. L. lat. 25. L. transv. $4\frac{1}{2}/3\frac{1}{2}$.

The osseous dorsal ray is rather strong, unserrated, its stiff portion being as long as the head, without snout. There are two longitudinal series of scales between the lateral line and the root of the ventral. Body compressed, elongate; *its depth is equal to the length of the head and two-sevenths of the total (without caudal).* Snout rather elongate, longer than the eye, which is more than one-fifth of the length of the head; interorbital space flat, upper jaw overlapping the lower; barbel as long as or slightly longer than the eye. Dorsal considerably lower than the body; its origin is opposite to that of the ventral, and midway between the end of the snout and the root of the caudal. Anal fin of moderate size; caudal deeply forked. Light brownish above, silvery below; the membranes between the scales brownish; a black spot at the base of the caudal on each side. A blackish spot on each side of the hinder part of the base of the dorsal fin.

Ceylon.

a, b. Adult ($7\frac{1}{2}$ inches long) and young. Purchased of Mr. Cuming.

Mr. Blyth has overlooked the barbel in this species.

127. Barbus thermalis.

Leuciscus thermalis, *Cuv. & Val.* xvii. p. 94, pl. 490 (bad).

D. 11. A. 8. L. lat. 25. L. transv. $5/4\frac{1}{2}$.

The osseous dorsal ray is feeble, unserrated, longer than the head, without snout. There are three longitudinal series of scales between the lateral line and the ventral fin. Body compressed, oblong, its depth being contained twice and four-fifths in the total length (without caudal), the length of the head being two-sevenths of the same. Snout moderate, equal to the eye, which is two-sevenths of the length of the head; interorbital space convex; upper jaw slightly overlapping the lower; barbel shorter than the eye. The height of the dorsal fin is only two-thirds of that of the body, its origin opposite to that of the ventral, and midway between the end of the snout and the root of the caudal. Anal fin of moderate size; caudal forked. Brownish above, silvery beneath; the membranes between the scales brown. A black spot on each side at the base of the caudal. Dorsal fin with a diffused blackish blotch near the base behind the osseous ray; a round blackish spot on the end of the lateral line.

Ceylon; Cachar.

a. Adult. Cachar. Presented by Lieut.-Col. Playfair.
b–c. Three inches long. Ceylon. Purchased of Mr. Cuming.

Valenciennes has evidently overlooked the barbels. Lateral line distinct to the end. This species may be the *Systomus carnaticus* of Mr. Jerdon; but the description given by this gentleman is so indefinite that it may be applied to several other species. Mr. Day has not taken any notice of it.

128. Barbus chola.

Cyprinus chola, *Ham. Buch. Fish. Ganges*, pp. 312, 389.
Systomus chola, *M'Clell. Ind. Cypr.* pp. 286, 384, pl. 58. fig. 3.

L. lat. 26. Osseous dorsal ray smooth; the height of the body is contained twice and two-fifths in the total length (without caudal). A small black spot on the middle of the root of the caudal fin.

North-eastern Bengal; Middle Assam.

129. Barbus sophoroides.

Systomus sophore, *Bleek. Verh. Bat. Gen. Ned. Ind.* 1853, xxv. *Bengal*, p. 127.

D. 11. A. 7. L. lat. 26. L. transv. $5\frac{1}{2}/5$.

The osseous dorsal spine is of moderate strength, smooth, not quite so long as the head, without snout. The height of the body is contained twice and two-thirds in the total length (without caudal), the length of the head thrice and two-fifths. Snout obtuse, as long as the eye, which is two-sevenths of the length of the head; jaws equal in front; barbels shorter than the eye. There are three and a half longitudinal series of scales between the lateral line and the ventral fins. The origin of the dorsal fin is a little before that of the ventrals, and midway between the end of the snout and the root of the caudal fin. A black spot across the base of the middle dorsal rays; a round black spot at the root of the caudal.

Assam; Bengal.

a–b. Adult (3 inches long). Cachar. From Col. Playfair's Collection.
c. Adult. River Hooghly. From Dr. Bleeker's Collection.

This species, though very closely allied to *B. sophore*, appears to be distinct, not only on account of the presence of barbels, but also of the smaller size of scales.

130. Barbus amphibius.

Capoëta amphibia, *Cuv. & Val.* xvi. p. 282, pl. 478 (not good).

D. 11. A. 7. L. lat. 23. L. transv. $4\frac{1}{2}/4$.

The osseous dorsal ray is feeble and smooth*. Mouth narrow, barbels small; snout somewhat pointed, its length being a little more than the diameter of the eye; the upper jaw slightly overlaps the lower. The height of the body is contained thrice and one-third in the total length (without caudal), the length of the head four times; the depth of the head equals its length, without snout. There are two longitudinal series of scales between the lateral line and the root of the ventral fin. The dorsal fin commences in advance of the origin of the ventral, and is nearer to the end of the snout than to the root of the caudal. Uniform silvery.

Bombay.

a. Five inches long. Presented by Dr. A. Günther.

131. Barbus layardi.

D. 11. A. 8. L. lat. 23. L. transv. $4/4\frac{1}{2}$.

The osseous dorsal ray is strong, unserrated, its stiff portion being slightly longer than the head, without snout. There are two and a half longitudinal series of scales between the lateral line and the ventral fin. Body compressed, rather elevated anteriorly, with the upper profile deeply concave above the neck; its depth is rather more than one-third of the total length (without caudal), in which the length of the head is contained thrice and one-third. Head rather depressed, longish; snout of moderate length, much longer than the eye, which is one-fourth of the length of the head; interorbital space flat, upper jaw overlapping the lower; barbel as long as the eye. Dorsal fin considerably lower than the body; its origin is opposite to that of the ventral, and nearer to the root of the caudal than to the end of the snout. Anal fin of moderate size. Caudal deeply forked. Blackish above, sides and belly uniform silvery.

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* The serrature indicated in the figure appears to be an artist's error.

Ceylon.

a, b. Adult, 5–6 inches long. Ceylon.
c. Half-grown. Ceylon. Presented by F. Layard, Esq.

132. Barbus brevis.

Systomus / Puntius (Capoëta) brevis, *Bleek. Verh. Bat. Gen.* xxiii. *Oost-Java*, p. 21; or *Prodr. Cypr.* p. 355; or *Atl. Ichthyol. Cypr.* p. 108, tab. 36. fig. 3.

D. 12. A. 8. L. lat. 23–24. L. transv. $4\frac{1}{2}/5$.

The osseous dorsal spine is of moderate strength, smooth, as long as the head, without snout. The height of the body is contained twice and two-thirds in the total length (without caudal), the length of the head thrice and two-thirds. Snout obtuse, as long as the eye, which is two-sevenths of the length of the head; jaws equal in front; barbels two, very small. There are two and a half longitudinal series of scales between the lateral line and the ventral fins. The origin of the dorsal fin is opposite to that of the ventrals, and midway between the end of the snout and the root of the caudal fin. A silvery band along the middle of the side. Caudal spot none.

Surabaya and Gombong (Java).

a–c. Typical specimens. From Dr. Bleeker's Collection.

133. Barbus filamentosus.

Leuciscus filamentosus, *Cuv. & Val.* xvii. p. 96, pl. 492.
Systomus assimilis, filamentosus *et* maderaspatensis, *Jerdon, Madr. Journ. Lit. & Sc.* xv. pp. 318 & 319.
Puntius filamentosus, *Day, Fish. Malabar*, p. 215.

D. 11. A. 7–8. L. lat. 21. L. transv. $4\frac{1}{2}/3\frac{1}{2}$.

The osseous dorsal ray is smooth, feeble, not much stronger than the others. There are two longitudinal series of scales between the lateral line and the root of the ventral. Body compressed: its height is contained twice and three-fourths in the total length (without caudal); the length of the head is one-fourth of the same. Snout rather obtuse, as long as the eye, which is somewhat less than two-sevenths of the length of the head; interorbital space slightly convex; upper jaw slightly overlapping the lower; barbel very small. The height of the dorsal fin is two-thirds of the depth of the body; its origin is opposite that of the ventral, and equally distant from the root of the caudal and the end of the snout. Anal fin of moderate size, higher than long; caudal deeply forked. Silvery, greenish above; a large, cuneiform, black spot on the lateral line above the hinder part of the anal fin. Tips of the caudal lobes black, with white extremities.

Ceylon; Cochin.

a, b, c, d–f. Fine adult and half-grown specimens ($4\frac{1}{2}$ inches long). Ceylon.

g. Adult. Nilgherries. Presented by Surgeon Day.

h–k. Skins, from 3 to $5\frac{1}{2}$ inches long. Cochin.

Valenciennes and other naturalists have overlooked the barbel in this species. It appears that in some (male?) individuals the middle dorsal rays are produced into long filaments, at least at certain seasons.

Surgeon Day believes that *Leuciscus mahecola*, Cuv. & Val. xvii. p. 305, pl. 502, is the young of this species; I hesitate to adopt this opinion, because the black caudal spot is more advanced in *B. filamentosus* than in the figure of *L. mahecola*.

cc. *No osseous dorsal ray.*

134. Barbus denisonii.

Labeo denisonii, *Day, Proc. Zool. Soc.* 1865, p. 299.
Puntius denisonii, *Day, Fish. Malabar*, p. 212, pl. 16. fig. 2.

D. 11. A. 8. L. lat. 28. L. transv. $4\frac{1}{2}/3\frac{1}{2}$.

None of the dorsal rays osseous. Mouth small; barbel considerably longer than the eye. Snout of moderate length, rather obtuse in front, longer than the eye, with the jaws equal. The height of the body is somewhat more than the length of the head, and one-fourth of the total (without caudal). There are two longitudinal series of scales between the lateral line and the root of the ventral. The dorsal fin commences in advance of the ventral, nearer to the end of the snout than to the root of the caudal. A black streak runs from the snout, through the eye, to the middle of the root of the caudal; a red band above the black one during life. Each caudal lobe with an oblique black cross band.

Hill-ranges of Malabar.

a, b. Two of the typical specimens. From the Collections of Mr. Day and Dr. Bleeker.

135. Barbus hamiltonii.

? Systomus chola, *Jerdon, Madr. Journ. Liter. & Sc.* xv. 1849, p. 316.
Puntius hamiltonii, *Day, Fish. Malabar*, p. 213.

D. 11. A. 8. L. lat. 24. L. transv. 5/3.

Dorsal fin without osseous ray. Barbels much shorter than the eye; snout short. The height of the body is one-fourth of the total length (with the caudal), the length of the head two-elevenths; the diameter of the eye is two-fifths of the length of the head. A dark diffused spot on the end of the lateral line. (*Day.*)

Fresh waters of Southern India.

136. Barbus bimaculatus.

Gnathopogon bimaculatus, *Bleek. Verhandl. Maatsch. Holl. Harlem,* 1864, *Cobit. et Cypr. Ceyl.* p. 17, tab. 4. fig. 1.

D. 10. A. 7. L. lat. 23. L. transv. $3\frac{1}{2}/4\frac{1}{2}$.

No osseous dorsal ray; there are only seven branched rays behind the simple one (third). There are two and a half longitudinal series of scales between the lateral line and the ventral fin. Body compressed, elongate, with the upper profile slightly arched; its depth is two-sevenths of the total length (without caudal), the length of the head one-fourth. Head rather depressed, longish; snout not longer than the eye, which is one-fourth of the length of the head; interorbital space flattish; upper jaw overlapping the lower; barbel nearly as long as the eye. Dorsal fin considerably lower than the body; its origin is somewhat in advance of that of the ventral, and nearer to the end of the snout than to the root of the caudal. Anal fin of moderate size; caudal deeply forked. A deep black spot across the base of the posterior dorsal rays; another on the end of the lateral line.

Ceylon.

a–g, h. From $1\frac{1}{2}$ to $2\frac{1}{3}$ inches long. Purchased of Mr. Cuming.

137. Barbus oligolepis.

Systomus / Puntius } (Capoëta) oligolepis, *Bleek. Nat. Tydschr. Ned. Ind.* iv. p. 296; or *Prodr. Cypr.* p. 357; or *Atl. Ichthyol. Cypr.* p. 109, tab. 2. fig. 2.

D. 11. A. 7. L. lat. 17. L. transv. 9.

None of the dorsal rays osseous. Mouth rather small; barbel very short; snout shorter than the eye, obtuse, with the upper jaw overlapping the lower. The height of the body is two-fifths of the total length (without caudal), the length of the head two-sevenths. The dorsal fin commences a little in advance of the ventral, midway between the end of the snout and the root of the caudal. The cutaneous pouches of the scales on the sides are deep black.

Sumatra.

a. One of the typical specimens, $1\frac{1}{2}$ inch long, not in good state. Priamam. From Dr. Bleeker's Collection.

β. African.

138. **Barbus afer.**

Barbus (Capoëta) afer, *Peters, Monatsber. Ak. Wiss. Berlin,* 1864, p. 395.

D. 9. A. 7. L. lat. 26. L. transv. 4/4.

The simple dorsal rays are very feeble. There are three longitudinal series of scales between the lateral line and the ventral fin. The height of the body is equal to the length of the head, and contained four times and three-fourths in the total (without caudal). The diameter of the eye is two-thirds of the width of the interorbital space, and two-ninths of the length of the head. Barbels well developed. Origin of the dorsal fin opposite to that of the ventrals. (*Ptrs.*)

Cape of Good Hope.

139. **Barbus kurumanni.**

Castelnau, Poiss. Afr. Austr. p. 59.

D. 1/8. A 6.

Scales large. Body elongate. Upper lip with two small barbels. Dorsal fin with a very strong (serrated) spine. A roundish black spot on the root of the caudal fin. (*Castelnau.*)

River Kuruman.

These characters are given merely on the authority of the authors quoted.

2. *Snout with tubercles* (Varicorhinus).

140. **Barbus beso.**

Varicorhinus beso, *Rüppell, Mus. Senckenb.* ii. 1837, p. 21, taf. 3. fig. 2.

Labeo varicorhinus, *Cuv. & Val.* xvii. p. 491.

D. 12/(13)*. A. 7. L. lat. 31–32.

The osseous dorsal ray is of moderate strength, smooth, and about as long as the head, without snout. Four longitudinal series of scales between the lateral line and the root of the ventral fin. Snout obtusely rounded, with small tubercles; mouth inferior; barbels small. The height of the body is contained thrice and one-third in the total length (without caudal), the length of the head five times. Origin of the dorsal fin somewhat in advance of that of the ventrals. Caudal fin forked. Coloration uniform. (*Rüpp.*)

Lake Zana.

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* Rüppell says D. $\frac{3}{10}$; and also in the figure ten branched rays are distinct; however, there is evidently an error, as the last ray ought to be represented as split to the base. Instead of this we see the two last rays of perfectly the same structure, and equidistant, as the others. Therefore I suppose that the last ray (which is split to the base) is represented by Rüppell as two rays, and that there are nine branched rays only.

III. *Barbels none.*

A. *L. lat.* 34–35.

141. Barbus bulu.

Systomus bulu, *Bleek. Nat. Tydschr. Ned. Ind.* ii. p. 207; or *Prodr. Cypr.* p. 360.

Puntius bulu, *Bleek. Atl. Ichthyol. Cypr.* p. 110, tab. 26. fig. 2.

D. 12. A. 8. L. lat. 35. L. transv. 7/7.

The osseous dorsal ray is of moderate strength, evenly serrated behind, and much longer than the head. There are four and a half longitudinal series of scales between the lateral line and the root of the ventral fin. Snout short, obtuse, convex in front. The height of the body is contained twice and one-fourth in the total length (without caudal), the length of the head four times. Origin of the dorsal fin opposite to that of the ventrals. Caudal fin deeply forked. Anterior anal ray bony. Coloration uniform.

Borneo; Siam; Sumatra.

a. Adult: type of the species. From Dr. Bleeker's Collection.

142. Barbus waandersii.

Systomus waandersi, *Bleek. Nat. Tydschr. Ned. Ind.* xvi. p. 358; or *Prodr. Cypr.* p. 359.

Puntius waandersi, *Bleek. Atl. Ichthyol. Cypr.* p. 110, tab. 34. fig. 2.

D. 12. A. 8. L. lat. 35. L. transv. 8½/7.

The osseous dorsal ray is of moderate strength, evenly and finely serrated behind, and scarcely longer than the head. There are five longitudinal series of scales between the lateral line and the root of the ventral fin. Snout short, obtuse, convex in front. The height of the body is contained twice and one-ninth in the total length (without caudal), the length of the head four times and two-fifths. Origin of the dorsal fin somewhat behind that of the ventrals. Caudal fin deeply forked. Anterior anal ray bony. Coloration uniform.

Java.

a. Type of the species; female, 12 inches long. Ngawi. From Dr. Bleeker's Collection.

143. Barbus lawak.

Systomus lawak, *Bleek. Nat. Tydschr. Ned. Ind.* ix. p. 411; or *Prodr. Cypr.* p. 361.

Puntius lawak, *Bleek. Atl. Ichthyol. Cypr.* p. 111, tab. 40. fig. 2.

D. 12. A 10. L. lat. 34.

The osseous dorsal ray is rather feeble, evenly serrated behind, and rather longer than the head. There are four longitudinal series of scales between the lateral line and the root of the ventral fin. Snout short, obtuse, convex in front. The height of the body is contained twice and a half in the total length (without caudal), the length of the head thrice and two-thirds. Origin of the dorsal fin somewhat behind that of the ventrals. Caudal fin deeply forked. Anterior anal ray bony. Coloration uniform

Java.

a. Type of the species: not in good state. From Dr. Bleeker's Collection.

144. Barbus melanopterus.

Barbus melanopterus, *Bleek. Nat. Tydschr. Ned. Ind.* i. p. 11.
Systomus melanopterus, *Bleek. l. c.* iii. p. 429.
Balantiocheilus melanopterus, *Bleek. Prodr. Cypr.* p. 301; or *Atl. Ichthyol. Cypr.* p. 80, tab. 39.

D. 11. A. 8. L. lat. 35. L. transv. $6\frac{1}{2}/5$.

The osseous dorsal ray is strong, strongly serrated, its stiff portion being as long as the head. *Lower lip with a broad, free, continuous fold.* Three and a half longitudinal series of scales between the lateral line and ventral fin. The height of the body is a little more than one-third of the total length (without caudal), the length of the head a little more than one-fourth. Snout somewhat pointed, a little longer than the eye; mouth small. The dorsal fin commences vertically above the origin of the ventral, nearly midway between the end of the snout and the root of the caudal; the first anal ray rather thickened. Caudal fin deeply forked. The outer portions of the vertical and ventral fins deep black.

Sumatra, Siam, Borneo.

a. One of the typical examples. From Dr. Bleeker's Collection.

This species, having the gill-openings a little narrower than some other species of *Barbus*, was separated by Dr. Bleeker as a distinct genus. At a later period he appears to have perceived that numerous other Barbels have the gill-openings as narrow as the present; and dropping this as the principal character, he nevertheless maintains the genus, but on very insufficient grounds.

145. Barbus apogon.

Barbus apogon, (*Kuhl*) *Cuv. & Val.* xvi. p. 392.
Systomus apogon, *Bleek. Nat. Tydschr. Ned. Ind.* iii. p. 428.
—— apogonides, *Bleek. l. c.* ix. p. 410.
Cyclocheilichthys (Anematichthys) apogon, *Bleek. Prodr. Cypr.* p. 378; or *Atl. Ichthyol. Cypr.* p. 88, tab. 29. fig. 2.
—— (——) apogonides, *Bleek. Prodr. Cypr.* p. 379; or *Atl. Ichthyol. Cypr.* p. 89, tab. 30. fig. 3.

D. 12. A. 8. L. lat. 34–35. L. transv. 7/6.

The osseous dorsal ray is of moderate strength, evenly serrated behind, shorter than the head. There are four longitudinal series of scales between the lateral line and the root of the ventral fin. Snout of moderate extent, rather obtuse, with the lower jaw received within the upper. Upper profile of the head concave. The height of the body is contained twice and a half or twice and three-fifths in the total (without caudal), the length of the head thrice and one-fourth or thrice and three-fourths. *Origin of the dorsal fin distinctly be-*

hind the root of the ventral. Anterior anal ray bony. Each scale generally with a dark spot at the base; generally a blackish spot on the end of the lateral line.

Sumatra; Java; Borneo; Banka.

a, b. Adult. Purchased.

c. Half-grown. Java. From Dr. Bleeker's Collection: one of the typical specimens of his *S. apogonides.*

146. Barbus janthochir.

Systomus janthochir, *Bleek. Nat. Tydschr. Ned. Ind.* v. p. 448.
Cyclocheilichthys (Anematichthys) janthochir, *Bleek. Prodr.* p. 381; or *Atl. Ichthyol. Cypr.* p. 89, pl. 31. fig. 3.

D. 12. A. 8. L. lat. 34. L. transv. $6\frac{1}{2}/6$.

The osseous dorsal ray is rather feeble, finely serrated, and not longer than the head. There are four longitudinal series of scales between the lateral line and the root of the ventral fin. Snout of moderate extent, somewhat pointed, with the lower jaw received within the upper. Upper profile of the head straight. The height of the body is but little more than the length of the head, and two-sevenths of the total (without caudal). Origin of the dorsal fin a little behind that of the ventral. A narrow blackish band runs along the lateral line. Dorsal and caudal fins with broad blackish margins; dorsal blackish in its lower anterior part.

Borneo.

a. One of the typical specimens. From Dr. Bleeker's Collection.

147. Barbus proctozysron.

Puntius proctozysron, *Bleek. Nederl. Tydschr. Dierk.* 1864, p. 197; or *Versl. en Meded. Akad. Wet. Natuurk.* xvii. p. , c. tab.

D. 11. A. 7–8. L. lat. 36–37. L. transv. $\frac{9\text{-}10}{?}$.

Anal fin with a long serrated osseous ray; the osseous dorsal ray is of moderate strength, at least as long as the head, and serrated. There are seven longitudinal series of scales between the lateral line and ventral fin. Snout obtuse, with the upper profile convex. Profile of the nape concave. The height of the body is one-half of the total length (without caudal), the length of the head two-sevenths. Origin of the dorsal fin a little behind that of the ventral. Coloration uniform. (*Blkr.*)

Siam.

B. *L. lat. less than* 30.

148. Barbus duvaucelii.

Leuciscus duvaucelii, *Cuv. & Val.* xvii. p. 95, pl. 491 (not p. 77).
Systomus duvaucelii, *Bleek. Prodr. Cypr.* p. 278 (name only).

D. 10. A. 7. L. lat. 27.

The osseous dorsal ray is feeble and smooth. The height of the body is contained twice and two-fifths in the total length (without caudal). Caudal fin forked. A black spot on the end of the lateral line. (*Val.*)

Bengal.

149. Barbus sophore.

Cyprinus sophore, *Ham. Buch. Fish. Gang.* pp. 310, 389, pl. 19. fig. 86.
Systomus sophore, *M'Clell. Ind. Cypr.* pp. 285, 382.
Leuciscus stigma, *Cuv. & Val.* xvii. p. 93, pl. 489 (not good).

D. 11. A. 7. L. lat. 23–24. L. transv. 4½/4½.

The osseous dorsal spine is of moderate strength, smooth, shorter than or as long as the head, without snout. The height of the body is contained twice and two-thirds or thrice in the total length (without caudal), the length of the head four times. Snout obtuse, as long as the eye, which is two-sevenths of the length of the head; jaws equal in front; barbels none. There are three longitudinal series of scales between the lateral line and the ventral fins. The origin of the dorsal fin is a little behind that of the ventrals, and midway between the end of the snout and the root of the caudal fin. A large black spot across the base of the middle dorsal rays; a round black spot at the root of the caudal.

Bengal, Himalayas.

a–c, *d–g*. Adult (4 inches long) and half-grown. Bengal.
h–m. Adult and half-grown. Bengal. From the Collection of the East-India Company.
n–o. Young. Hindostan. From the Collection of Messrs. von Schlagintweit.
p. Half-grown. Sikkim. From the Collection of Messrs. von Schlagintweit.
q–u. Adult. Madras. Presented by Captain Mitchell.

According to Buchanan, this species would appear to be provided with four minute barbels; according to M'Clelland the barbels are absent. I have described a similar species with a pair of barbels (*B. sophoroides*).

150. Barbus chrysopterus.

Systomus chrysopterus, *M'Clell. Ind. Cypr.* p. 381.
? Leuciscus sulphureus, *Cuv. & Val.* xvii. p. 96.

L. lat. 23–24. Osseous dorsal ray rather feeble and smooth. There are three longitudinal series of scales between the lateral line and the root of the ventral fin. The height of the body is contained twice and one-third in the total length (without caudal). Coloration uniform.

Bramaputra; Peshawur; ? Mysore.

a. Adult: skin. Peshawur. From Dr. Griffith's Collection.

151. Barbus ticto.

Cyprinus ticto, *Ham. Buch. Fish. Gang.* pp. 314, 389, pl. 8. fig. 87.
Systomus ticto, *M'Clell. Ind. Cypr.* p. 382; *Bleek. Verh. Bat. Gen. Ned. Ind.* xxv. 1853, p. 128.
? Rohtee ticto, *Sykes, Trans. Zool. Soc.* ii. p.365.

D. 11. A. 7. L. lat. 23. L. transv. 5/6.

The osseous dorsal ray is of moderate strength, and serrated. There are four longitudinal series of scales between the lateral line and the root of the ventral fin. Lateral line incomplete. Body strongly compressed, its depth being contained twice and one-third or twice and a half in the total length (without caudal); the length of the head is contained thrice and two-thirds in the same. A small black spot on the commencement of the lateral line, another larger one on the lateral line, immediately behind the anal fin. Upper two-thirds of the dorsal fin black.

Bengal; Assam; Himalayas.

a–b. Fine specimens. Ganges. From the Collection of the Zoological Society.
c. Adult, 2 inches long. River Hooghly. From Dr. Bleeker's Collection.
d. Adult. Presented by Lieut.-Col. Playfair.
e. Half-grown. Sikkim. From the Collection of Messrs. von Schlagintweit.
f–g. Adult: not in good state. Dekkan. From Colonel Sykes's Collection.
h–l. Adult, half-grown, and young. East India. From the Collection of the East-India Company.

152. Barbus conchonius.

Cyprinus conchonius, *Ham. Buch. Fish. Gang.* pp. 317, 389.
Systomus conchonius, *M'Clell. Ind. Cypr.* pp. 286, 384, tab. 44. fig. 8 (cop. from *Buchanan's MS. drawing*).
Puntius conchonius, *Steindachner, Sitzgsber. Ak. Wiss. Wien*, lvi. p.

D. 11. A. 7. V. 8. L. lat. 26–28. L. transv. 5½/5½.

The osseous dorsal ray is strong and serrated. The height of the body is scarcely less than one-half of the total length, without caudal fin, which is subtruncate. There are four and a half longitudinal series of scales between the lateral line and ventral fin. A round black spot on the lateral line, above the hinder part of the anal fin.

Ganges.

153. Barbus terio.

Cyprinus terio, *Ham. Buch. Fish. Gang.* pp. 313, 389.
Systomus gibbosus, *M'Clell. Ind. Cypr.* pp. 286, 385, tab. 44. fig. 7 (cop. from *Buchanan's MS. drawing*).

Scales large. The height of the body is more than the length of the head, or than one-third of the total (without caudal). Osseous dorsal ray feeble, not serrated. Profile of the nape very concave.

A round black spot on the lateral line, above the origin of the anal fin; a faint streak runs from the spot to the middle of the root of the caudal fin.

North-east of Bengal.

154. Barbus puntio.

Cyprinus puntio, *Ham. Buch. Fish. Gang.* pp. 318. 389

This fish is known from Buchanan's very vague description only. The body appears to be of moderate depth; (osseous dorsal ray not serrated). Scales large. A black ring round the end of the tail, and a black spot at the roots of the dorsal and anal fins.

Southern parts of Bengal.

155. Barbus titius.

Cyprinus titius, *Ham. Buch. Fish. Gang.* pp. 315, 389.
Systomus tetrarupagus. *M'Clell. Ind. Cypr.* pp. 285, 381, tab. 44. fig. 3.

Osseous dorsal spine smooth The height of the body is one-third of the total length (with the caudal). A black spot at either end of the lateral line.

Bengal; Brahmaputra; Assam

156. Barbus phutunio.

Cyprinus phutunio, *Ham. Buch. Fish. Gang.* pp. 319, 390.
Systomus leptosomus, *M'Clell. Ind. Cypr.* pp. 287, 387, tab. 44. fig. 2 (cop. from *Buchanan's MS. drawing*).
—— phutunio, *Bleek. Verh. Bat. Gen. Batav.* xxv. 1853, *Bengal*, p. 128

L. lat 20. The osseous dorsal ray is of moderate strength and serrated. The height of the body is two-fifths of the total length (without caudal). Caudal fin emarginate. A subtriangular black vertical band from the back to behind the pectoral fin; a second across the tail, immediately behind the anal fin. Two black spots on the back, one corresponding to the origin, the other to the end of the dorsal fin; a series of black dots along the middle of the dorsal

Bengal.

157. Barbus gelius.

Cyprinus gelius, *Ham. Buch. Fish. Gang.* pp. 320, 390.
Cyprinus canius, *Ham. Buch. l. c.*
Systomus gelius, *M'Clell. Ind. Cypr.* pp. 286, 386, tab. 44. fig. 4 (cop. from *Buchanan's MS. drawing*).
—— canius, *M'Clell. l. c.* pp. 287, 387, tab. 44. fig. 6.
Systomus gelius, *Bleek. Verh. Bat. Gen. Nederl. Ind.* xxv. 1853. *Bengal*, p. 129.

L. lat. 23. The osseous dorsal ray is somewhat feeble, and serrated. The height of the body is contained from twice and two-thirds to thrice in the total length (without caudal fin, which is emarginate). Similar in coloration to *B. phutunio*, but with a silvery band along the middle of the side; irregular black blotches on the trunk, above and below the silvery band. A black band round the middle of the free portion of the tail. A deep black spot on the base of the anterior dorsal, anal, and ventral rays.

Bengal.

a. River Hooghly. From Dr. Bleeker's Collection.

158. Barbus cumingii.

Puntius phutunio, *Bleek. Cypr. & Cobit. Ceyl. in Nat. Verhandl. Holl. Maatsch. Harlem*, 1864–65, p. 12, tab. 4. fig. 4 (not *Ham. Buch.*).

D. 10. A. 8. L. lat. 21. L. transv. 3½/3½.

Osseous dorsal ray rather feeble, indistinctly denticulated. There are eight other rays behind the osseous ray. Three longitudinal series of scales between the lateral line and the root of the ventral. Body ovate, its height being contained twice and a half in the total length (without caudal), the length of the head four times; the depth of the head is not much less than its length. The diameter of the eye is less than the width of the interorbital space (which is convex), one-third of the length of the head, and rather more than that of snout, which is moderately obtuse. Mouth inferior, small. The dorsal fin is much lower than the body, and commences opposite the origin of the ventral, its first ray being equidistant from the end of the snout and the root of the caudal. Anal fin rather small; caudal deeply forked. The pectoral extends to the ventral. Body with two black vertical bands—the first across the middle of the trunk, the second behind the anal fin. Each scale with a silvery vertical streak.

Ceylon.

a. b–c, d–f, g–k. Two inches long. Purchased of Mr. Cuming.

159. Barbus nigrofasciatus.

Closely allied to *B cumingii*, from which it differs, beside in coloration, in having one more longitudinal series of scales, and in having the scales without, or with scarcely conspicuous radiated striæ, five or six of which are very distinct in *B. cumingii*.

D. 11. A. 7. L. lat. 20. L. transv. 4½/4.

Osseous dorsal ray of moderate strength, finely denticulated. There are eight other rays behind the osseous ray. Three longitudinal series of scales between the lateral line and the root of the ventral. Body ovate, its height being contained twice and one-fifth in the total length (without caudal), the length of the head thrice and four-fifths; the depth of the head is not much less than its length The diameter of the eye is less than the width of interorbital space (which is convex), one-third of the length of the head, and rather more than that of the snout, which is moderately obtuse. Mouth inferior, small. The dorsal fin is much lower than the body, and commences opposite to the origin of the ventral, its first ray being equidistant from the end of the snout and the root of the caudal. Anal fin rather small, caudal deeply forked. The pectoral extends to beyond the root of the ventral. A black band on the occiput from one eye to the other. Body with three black vertical bands—the first across the middle of the trunk, the second between the fore part of the dorsal fin and the hinder part of the belly, the third immediately behind the anal fin. Dorsal fin and anterior part of the ventral and anal fins black; caudal colourless. Most scales with a central silvery spot.

Ceylon.

a–c, d–f, g–l. From 1 to 2½ inches long. Southern Ceylon. Purchased of Mr. Cuming.

160. **Barbus vittatus.**

Puntius vittatus, *Day, Proc. Zool. Soc.* 1865, p. 303; or *Fish. Malabar*, p. 215, pl. 13. fig. 1 (not good).

L. lat. 22. L. transv. 7.

Lateral line incomplete. The osseous dorsal ray is feeble and smooth. Snout shorter than the eye. The height of the body is contained twice and two-thirds in the total length (without caudal), the length of the head thrice and a half. The origin of the dorsal fin is somewhat in advance of that of the ventrals, and midway between the end of the snout and the root of the caudal. Caudal fin forked. Adult specimens (1½ inch long) with small black spots—one at the beginning and one at the end of the base of the dorsal, on the back, a third on the root of the caudal, a fourth between the ventral and anterior anal rays. One or more of these spots may be absent. Dorsal fin with an oblique black band, ascending forwards from the base of the last to the middle of the anterior dorsal rays. Top of the dorsal blackish.

Malabar.

a. One of the typical specimens. Cochin. Presented by Surgeon Day.

161. **Barbus modestus.**

Puntius modestus, *Kner, Novara, Fische*, p. 348, taf. 15. fig. 3.

D. 10–11. A. 7. V. 9. L. lat. 22–23. L. transv. 4½/?.

Lateral line complete. Dorsal fin without enlarged osseous ray. Snout shorter than the eye. The height of the body is one-third, the length of the head two-sevenths of the total (without caudal). Origin of the dorsal fin nearly opposite to that of the ventrals, and midway between the end of the snout and the root of the caudal. Caudal fin deeply forked. Body immaculate, with an indistinct silvery band along the side. Dorsal fin crossed by a dark band. (*Kner.*)

Madras.

162. Barbus cosuatis.

Cyprinus cosuatis, *Ham. Buch. Fish. Gang.* pp. 338, 392.
Systomus malacopterus, *M'Clell. Ind. Cypr.* pp. 287, 386, tab. 44. fig. 9.
? Rohtee pangut, *Sykes, Trans. Zool. Soc.* ii. p. 365.
Leuciscus cosuatis, *Bleek. Verh. Bat. Gen. Ned. Ind.* xxv. 1853, p. 139.

L. lat. 22. Dorsal fin without osseous ray. The height of the body is contained twice and three-fourths in the total length, without caudal fin, which is forked. Top of the dorsal fin and a spot across the middle of the anterior anal rays black.

Bengal.

a. River Hooghly. From Dr. Bleeker's Collection.

163. Barbus pyrrhopterus.

Systomus pyrropterus, *M'Clell. Ind. Cypr.* p. 383, pl. 44. fig. 1.

L. lat. 22. L. transv. $4\frac{1}{2}/4\frac{1}{2}$. The osseous dorsal ray is of moderate strength and serrated. There are three longitudinal series of scales between the lateral line and the root of the ventral fin. The height of the body is contained twice and one-third in the total length (without caudal). A roundish black spot on the lateral line, immediately behind the anal fin.

Upper Assam.

a–e. Skins, in bad state: typical examples. From M'Clelland's Collection.
f. From the Collection of the East-India Company.

20. THYNNICHTHYS *.

Thynnichthys, *Bleeker, Prodr. Cypr.* p. 306.

Scales small. Dorsal fin without an osseous ray, with not more than nine branched rays, commencing nearly opposite to the ventrals; anal fin short. Head large, strongly compressed; eye without well-developed adipose membrane, in the middle of the depth of the head. Snout with the integuments very thin; there is no upper lip, and the lower jaw has a thin labial fold on the sides only. Mouth anterior and lateral; barbels none. Lateral line running nearly along the middle of the tail. Gill-rakers none; laminæ branchiales long, half as long as the postorbital portion of the head; pseudobranchiæ none. Pharyngeal teeth lamelliform, with flat oblong crown, 5 . 3 or 4 . 2—2 . 4 or 3 . 5, the teeth of the three series being wedged into one another.

East-Indian archipelago and Pegu.

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* Leuciscus harengula, *C. & V.* xvii. p. 303, pl. 500.—Irawaddy.

1. Thynnichthys thynnoides.

Leuciscus thynnoides, *Bleek. Nat. Tydschr. Ned. Ind.* iii. p. 599.
Thynnichthys thynnoides, *Bleek. Prodr. Cypr.* p. 408; and *Atl. Ichthyol. Cypr.* p. 130, pl. 42. fig. 1.

D. 12. A. 7. L. lat. 58–60. L. transv. 13/12.

The height of the body is a little less than the length of the head, which is contained thrice and one-fourth in the total (without caudal). The diameter of the eye is somewhat less than the length of the snout, and one-fourth of that of the head. Coloration uniform.

Borneo and Sumatra.

a. Type of the species. Sumatra. From Dr. Bleeker's Collection.

2. Thynnichthys polylepis.

Bleeker, Prodr. Cypr. p. 407; or *Atl. Ichthyol. Cypr.* p. 129, pl. 41. fig. 1.

D. 12. A. 7. L. lat. 70–75. L. transv. $\frac{16\text{–}17}{16}$.

The length of the head is nearly equal to the height of the body, which is scarcely less than one-third of the total length (without caudal). The diameter of the eye is nearly equal to the length of the snout, and two-sevenths of the length of the head. Coloration uniform.

Borneo and Sumatra.

a. Type of the species. From Dr. Bleeker's Collection.

21. BARBICHTHYS.

Barbichthys *, *Bleeker, Prodr. Cypr.* p. 208.

Scales of moderate size. Dorsal fin without osseous ray, with not more than nine branched rays, commencing somewhat in advance of the ventrals. Snout smooth, not much projecting beyond the mouth, which is angular. Lips thin, continuous, not fringed, with an indistinct inner fold; the lower with a continuous free posterior margin; margin of the lower jaw rather obtuse. Barbels four, small. *The ring of suborbital bones is so broad as to cover the cheek entirely.* Lateral line running along the middle of the tail. Anal fin very short. Pharyngeal teeth 5 . 4 . 2—2 . 4 . 5.

East-Indian archipelago.

1. Barbichthys lævis.

Barbus lævis, *Cuv. & Val.* xvi. p. 192; *Bleek. Nat. Tydschr. Ned. Ind.* v. p. 447.
Dangila lipocheilus, *Cuv. & Val.* xvi. p. 232 (partim, see p. 40).
Barbus brachynemus, *Bleek. Verh. Bat. Gen.* xxiii. *Oost-Java*, p. 18.
—— gobioides, *Bleek. Nat. Tydschr. Ned. Ind.* iii. p. 592.
—— tæniopterus, *Bleek. l. c.* xiv. p. 475.
Barbichthys lævis, *Bleek. Prodr. Cypr.* p. 209; or *Atl. Ichthyol. Cypr.* p. 49, tab. 18.

D. 11. A. 7. L. lat. 36–38. L. transv. 6½/6½.

Three and a half longitudinal series of scales between the lateral line and ventral fin. The height of the body is contained thrice and a half in the total length (without caudal), the length of the head four times and two-thirds. Coloration uniform silvery; a blackish band along each caudal lobe.

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* Vox hybrida!

Java; Sumatra; Borneo.

a. Adult. From Dr. Bleeker's Collection.

22. AMBLYRHYNCHICHTHYS.

Amblyrhynchichthys, *Bleek. Prodr. Cypr.* p. 302.

Scales of moderate size; lateral line running along the middle of the tail. Dorsal fin with the third simple ray enlarged, with not more than nine branched rays, and commencing opposite the root of the ventral fins. Anal fin short; *caudal not scaly. Eyes with a broad annular adipose eyelid.* Mouth normally formed, at the lower side of the snout, which is high, short, obliquely truncated. Barbels none. Pharyngeal teeth 4 . 3 . 2—2 . 3 . 4.

East-Indian archipelago.

1. Amblyrhynchichthys truncatus.

Barbus truncatus, *Bleek. Nat. Tydschr. Ned. Ind.* i. p. 13.
Systomus truncatus, *Bleek. l. c.* ii. p. 60.
Amblyrhynchichthys truncatus, *Bleek. Prodr. Cypr.* p. 303; or *Atl. Ichthyol. Cypr.* p. 114, tab. 28. fig. 2.

D. 11. A. 7. L. lat. 36. L. transv. $5\frac{1}{2}/5\frac{1}{2}$.

The osseous dorsal ray is exceedingly strong, evenly serrated, and longer than the head, the length of which is contained four times and one-fourth in the total (without caudal). Three and a half longitudinal series of scales between the lateral line and the root of the ventral fin. Eye large, nearly twice as long as the snout and more than one-third of the length of the head. Caudal fin deeply forked. Coloration uniform.

Borneo and Sumatra.

a. Type of the species. From Dr. Bleeker's Collection.

23. ALBULICHTHYS.

Albulichthys, *Bleek. Prodr. Cypr.* p. 305.

Scales of moderate size; lateral line running along the middle of the tail. Dorsal fin with the third simple ray enlarged, with not more than nine branched rays, and commencing opposite to the root of the ventral fins. Anal fin short; *basal half of the caudal fin covered with scales. Eyes with a broad annular adipose eyelid.* Mouth normally formed, anterior, lateral; barbels none. Pharyngeal teeth compressed 4 . 3 . 2—2 . 3 . 4.

East-Indian archipelago.

1. Albulichthys albuloides.

Systomus albuloides, *Bleek. Nat. Tydschr. Ned. Ind.* ix. p. 425.
Albulichthys albuloides, *Bleek. Prodr. Cypr.* p. 306; or *Atl. Ichthyol. Cypr.* p. 114, tab. 33. fig. 2.

D. 11. A. 7. L. lat. 38. L. transv. $5\frac{1}{2}/5\frac{1}{2}$.

The osseous dorsal ray is slender, finely serrated. The height of the body is nearly equal to the length of the head, and one-fourth of the total length (to the end of the middle caudal rays). Three and a half longitudinal series of scales between the lateral line and the root of the ventral fin. Eye large, a little longer than the snout, and two-sevenths of the length of the head. Caudal fin deeply forked. Coloration uniform.

Sumatra and Borneo.

a. Type of the species. From Dr. Bleeker's Collection.

24. OREINUS *.

Oreinus, *M'Clell. Ind. Cypr.* p. 273, and *Calc. Journ. Nat. Hist.* ii. 1842, p. 580.
Schizothorax, sect. A, *Heckel, Fische aus Caschmir*, p. 11.
Schizopyge, sp., *Heckel, in Russegger's Reisen*, ii. 3. p. 285

Scales very small. Dorsal fin with a strong osseous serrated ray opposite to the ventrals. Snout rounded, with the mouth transverse and at its lower side; mandibles broad, short and flat, loosely joined together; margin of the lower jaw covered with a thick horny layer; a broad, fringe-like lower lip with free posterior margin. Barbels four. Vent and anal fin in a sheath, covered with enlarged, tiled scales. Pharyngeal teeth pointed, more or less hooked, 5 . 3 . 2—2 . 3 . 5.

Mountain-streams of the Himalayan region.

1. Oreinus plagiostomus.

? Schizothorax plagiostomus, *Heckel, Fische aus Caschmir*, p. 16, tab. 1.
Oreinus plagiostomus, *M'Clell. Calc. Journ. Nat. Hist.* ii. 1842, p. 581.

D. 11. A. 8.

Scales minute. The length of the head is about one-fifth of the total (without caudal). Snout broad, of moderate length, the eye being rather nearer to its end than to that of the gill-cover; barbels small; margin of the lower lip straight. Origin of the dorsal fin midway between the end of the snout and the root of the caudal, somewhat in advance of the root of the ventral. The osseous dorsal ray is of moderate strength, its stiff portion being three-fourths as long as the head; serrature rather feeble. Anal fin narrow and deep. Interorbital space broad, flattish; eye small. Anal scales well developed, the largest being nearly as broad as the orbit.

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* M'Clelland mentions and figures some other species under the heading of this genus; but the descriptions and figures are so defective that they cannot be received into the system:—

1. Oreinus guttatus, *M'Clell. Ind. Cypr.* pp. 273, 344, pl. 39. fig. 1.—Boutan.
2. —— progastus, *M'Clell. l. c.* pp. 274, 343, pl. 40. fig. 4.—The Adoee of the Assamese.
3. —— griffithii, *M'Clell. Calc. Journ. Nat. Hist.* ii. 1842, p. 581.—Koonur River, Affghanistan.

Cashmere; Afghanistan.

a. Adult: stuffed. Jullalabad. From Griffith's Collection.
b–c. Adult and half-grown: skins. Hellmund River. From Griffith's Collection.

The reason why I hesitate to identify the Afghan specimens with that described by Heckel from Cashmere, is the apparently greater length of the anal fin of the former. If laid backwards, it nearly reaches the root of the caudal fin, whilst it appears to terminate at some distance from it in the figure of the Cashmere example. The raised pores of the snout described by Heckel may have disappeared in our examples, which are dried.

2. **Oreinus sinuatus.**

The Jis (Cashmere).
Schizothorax sinuatus, *Heckel, Fische aus Caschmir*, p. 21, tab. 2.
Oreinus maculatus, *M'Clell. As. Res.* xix. p. 274, tab. 57. fig. 6, and *Calc. Journ. Nat. Hist.* ii. 1842, p. 580.

D. 11. A 8.

Scales minute. The length of the head is two-ninths or one-fifth of the total (without caudal). Snout of moderate length, the eye being nearer to its end than to that of the gill-cover; barbels small; margin of the lower lip concave. Origin of the dorsal fin a little nearer to the root of the caudal than to the end of the snout, opposite to the root of the ventral. The osseous dorsal ray is of moderate strength, its stiff portion being as long as the head, without snout; serrature well developed. Anal fin narrow and deep. Interorbital space broad, convex; eye rather small. Anal scales moderately developed, the largest being half as broad as the orbit. Body with blackish dots.

Cashmere, Punjab.

a. Half-grown: skin. Cashmere. Presented by H. Drummond, Esq.
b. Adult: skin. Noorpoor (Lower Hills of the Punjab). Presented by H. Drummond, Esq.
c. Half-grown: skin. River Ravee (Punjab). Presented by H. Drummond, Esq.
d. Adult: skin. Presented by H. Drummond, Esq.
e, f. Stuffed, 20 and 9 inches long. East Indies.
g–i. Young: skins. Gundamuck (Afghanistan). From Griffith's Collection.—Types of *O. maculatus.*

3. **Oreinus richardsonii.**

The Asla.
Cyprinus richardsonii, *Gray, Ind. Zool.* c. fig.

? Gonorhynchus petrophilus, *M'Clell. Journ. As. Soc. Beng.* iv. p. 39. c. fig. pessima; or *Ind. Cypr.* pp. 281, 371.
Oreinus maculatus, *Günth. Proc. Zool. Soc.* 1861, p. 224 (not *M'Clell.*).

D. 11. A. 8. L. lat. 140–145.

Head very small, its length being two-elevenths or one-sixth of the total (without caudal). Snout broad, of moderate length, the eye being rather nearer to its end than to that of the gill-cover; barbels small; margin of the lower lip straight. Origin of the dorsal fin nearly midway between the end of the snout and the root of the caudal, or rather nearer to the former than to the latter, slightly in advance of the root of the ventral. The osseous dorsal ray is strong, its stiff portion being three-fourths as long as the head; serrature of moderate strength. Anal fin very narrow and deep. Interorbital space broad, slightly convex; eye small. Anal scales well developed, the largest being nearly as broad as the orbit. Coloration uniform.

Nepal.

a. Stuffed, 18 inches long. Nepal. Presented by B. H. Hodgson, Esq.
b. Adult female, 9 inches long: not in a good state, has been in chloride of zinc. Nepal. Presented by B. H. Hodgson, Esq.
c–h. Young. Nepal. Presented by B. H. Hodgson, Esq.
i–k. Stuffed, 18 and 10 inches long. Kumaon. Presented by Capt. Strackey.
l. Skin, 15 inches long. Presented by T. C. Jerdon, Esq.

25. SCHIZOTHORAX *.

Schizothorax, sect. B & C, *Heckel, Fische aus Caschmir*, p. 11.
Schizothorax et Racoma, *M'Clell. Calc. Journ. Nat. Hist.* ii. 1842, p. 576.
Schizothorax et Schizopyge, sp., *Heckel, in Russegger's Reisen*, ii. 3. p. 285.
Opistocheilus, *Bleeker*.

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* 1. Racoma gobioides, *M'Clell. l. c.* pl. 15. fig. 3.—Bamean River.
2. —— chrysochlora, *M'Clell. l. c.* p. 577, pl. 15. fig. 2.—Lolpore, Cabul River.
3. —— nobilis, *M'Clell. l. c.* tab. 15. fig. 4.—Cabul River?
4. —— labiatus, *M'Clell. l. c.* p. 578, tab. 15. fig. 1, is described thus:—"The length of the head greater than the height of the body, and equal to a fourth of the entire length. Intermaxillary very protractile, and covered with a thick adipose integument; a thick trilobed integument to the lower jaw; cirri terminating in trident points.—Pushut, Koonar River near Jullalabad."
5. —— brevis, *M'Clell. l. c.*—Helmund River.
6. Schizothorax edeniana, *M'Clell. l. c.* p. 579, is described thus:—"Reflected posterior margin of the lower lip entire, lips thick, round, and soft; snout depressed; dorsal spine slender, soft, but harder at the base, where it is slightly serrated; lower jaw broad at the base, but narrower at the apex. Scales rather above the ordinary size.—Cabul River."

Opistocheilus (??) proprius, *Bleeker, Prodr. Cypr.* p. 115.—This is proposed to be the systematic name of *Schizothorax proprius*, M'Clell.! However, M'Clelland never described a fish under such a name, but distinguished a *subgenus* "*Schizothorax proprius*, M'Clell.," from Heckel's genus *Schizothorax*.—Calc. Journ. Nat. Hist. ii. p. 573.

Scales very small. Dorsal fin with a strong osseous serrated ray, opposite to the ventrals. Snout conically rounded, with the mouth arched, inferior or subinferior; mandibles of usual length and width. Barbels four. Vent and anal fin in a more or less developed sheath, covered with enlarged, tiled scales. Pharyngeal teeth pointed, more or less hooked, 5 . 3 . 2—2 . 3 . 5.

Mountain-streams of the Himalayan region and of Afghanistan; one doubtful species from Persia.

1. Schizothorax planifrons.

Schizothorax planifrons, *Heckel, Fische aus Caschmir*, p. 44, tab. 8. fig. 2.

D. 10. A. 7.

Scales minute. Mouth anterior, obliquely ascending forwards; jaws equal in length; margin of the lower jaw not cutting, its inside covered with a thin, deciduous cartilaginous layer*; lower labial fold interrupted in the middle; barbels about as long as the eye. Origin of the dorsal fin conspicuously nearer to the root of the caudal than to the end of the snout; the osseous dorsal ray strong, three-fifths as long as the head, armed behind with coarse teeth. Anal fin narrow, reaching nearly to the base of the caudal when laid backwards; caudal fin forked. The height of the body is one-fourth of the total length (without caudal), the length of the head is contained thrice and two-thirds in it. Interorbital space flat, the nuchal region being rather prominent. Snout much longer than the diameter of the eye, which is contained five times and a half in the length of the head. Anal scales moderately developed, the largest being half as broad as the orbit.

Cashmere.

a. Fine specimen, 7 inches long. Cashmere. From the Collection of Messrs. v. Schlagintweit.

b. Stuffed, 14 inches long. Cashmere. Presented by H. Drummond, Esq.

2. Schizothorax micropogon.

The Ramghurdi.

Schizothorax micropogon, *Heckel, Fische aus Caschmir*, p. 41, tab. 8. fig. 1.

D. 11. A. 8.

Scales minute. Cleft of the mouth small, crescentic, obliquely ascending forward, the jaws being subequal in length; margin of the lower jaw rounded, without horny covering; lower labial fold interrupted in the middle. *Barbels minute.* Origin of the dorsal fin opposite to that of the ventral, considerably nearer to the root of the caudal than to the end of the snout. The osseous dorsal ray is strong and coarsely serrated. Anal fin narrow, its longest ray not extending to the caudal when laid backwards. The height of the body is one-fifth of the total length (without caudal), the length of the head one-fourth. Snout of moderate length. The diameter of the eye two-ninths of the length of the head. Anal scales but little developed. (*Heck.*)

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* This appears to have been lost or overlooked in the specimen examined by Heckel.

Kashmere (River Tschilum).

Said to attain a length of 6 inches only.

3. Schizothorax hügelii.

The Grot.

Schizothorax hügelii, *Heckel, Fische aus Caschmir*, p. 36, tab. 7.

D. 11. A. 8. L. lat. ca 190.

Cleft of the mouth horseshoe-shaped, broader than long, obliquely ascending forward, the upper jaw being but little longer than the lower; margin of the lower jaw rounded, without horny covering; lower labial fold interrupted in the middle. Barbels shorter than the eye. Origin of the dorsal fin nearer to the root of the caudal than to the end of the snout, opposite to the base of the ventral. The osseous dorsal ray is rather short and but slightly serrated. Anal fin rather deep, its longest ray extending nearly to the caudal when laid backwards. The height of the body is nearly equal to the length of the head, which is two-ninths of the total (without caudal). Snout of moderate length. The diameter of the eye is contained six times and a half in the length of the head (in a specimen 14½ inches long). *Anal scales very large, the largest broader than the eye. Caudal fin emarginate.* Upper parts with blackish dots. (*Heck.*)

Kashmere.

4. Schizothorax curvifrons.

Heckel, Fische aus Caschmir, p. 25, tab. 3.

D. 11 A. 8

Scales minute; those of the lateral line (which are larger than the others) are said to be 100 in number. Mouth crescent-shaped, broader than long, small, slightly ascending forward, the upper jaw being longer than the lower. Lower jaw with a sharp margin (without horny cover?). Snout of moderate length; barbels much smaller than the eye; lower labial fold interrupted in the middle. Origin of the dorsal fin opposite to that of the ventrals, and nearly midway between the end of the snout and the root of the caudal. The osseous dorsal ray is of moderate strength, and conspicuously serrated; anal fin of moderate depth, not reaching the root of the caudal when laid backwards. The height of the body is somewhat more than the length of the head, and one-fourth of the total (without caudal). Eye small. Anal scales but little developed. (*Heck.*)

Cashmere.

5. Schizothorax niger.

Schizothorax niger, *Heckel, Fische aus Caschmir*, p. 29, tab. 5.

D. 12. A. 8.

Scales minute. Mouth inferior (the upper jaw a little projecting beyond the lower), horseshoe-shaped, nearly horizontal, broader than long; margin of the lower jaw cutting, its inside covered with a deciduous cartilaginous layer; lower labial fold interrupted in the middle; barbels shorter than the eye. Origin of the dorsal fin a little nearer to the root of the caudal than to the end of the snout, opposite to the root of the ventral: the osseous dorsal ray very strong, as long as the head without snout, armed behind with strong, closely set teeth. Anal fin small, shorter than the pectoral, not reaching by far to the root of the caudal, if laid backwards. Caudal fin forked. The height of the body equals the length of the head, and is two-ninths of the total (without caudal). Interorbital space scarcely convex. The length of the snout is much more than that of the diameter of the eye, which is one-fifth of the length of the head (in a specimen 7 inches long; in larger specimens it is smaller). Anal scales but little developed, the largest being one-third as broad as the orbit. Sides with very small blackish dots.

Cashmere.

a–b. Seven and five inches long. Cashmere. From the Collection of Messrs. von Schlaginweit.

6. Schizothorax intermedius.

? Schizothorax intermedius, *M'Clell. Calc. Journ. Nat. Hist.* ii. 1842, p. 579.

D. 10. A. 8.

Scales minute. Mouth inferior, crescent-shaped, nearly horizontal, much broader than long; upper jaw considerably projecting beyond the lower; margin of the lower jaw sharpish, its inside covered with a deciduous cartilaginous layer; lower labial fold interrupted in the middle; barbels about as long as the eye. Origin of the dorsal fin nearly midway between the root of the caudal and the end of the snout, apparently a little in advance of the root of the ventrals. The osseous dorsal ray of moderate strength, armed with closely set teeth behind. Anal fin narrow, high, longer than, or as long as, the paired fins, and extending nearly to the root of the caudal fin when laid backwards. The height of the body is nearly equal to the length of the head, which is a little less than one-fourth of the total (without caudal). Interorbital space flat. The length of the snout is much more than that of the diameter of the eye, which is one-sixth of the length of the head (in specimens 11 inches long). Anal scales not much developed, the largest being scarcely half as broad as the orbit.

Afghanistan.

a. Stuffed, 11 inches long. From the Collection of the East-India Company.

b. Skin, 9 inches long. Afghanistan. From Griffith's Collection.

Although this description differs essentially from the diagnosis (?) given by M'Clelland, I am convinced that the specimens (which were sent to Europe by M'Clelland with the name of *Schizothorax intermedius*) belong to the species for which this name was intended

7. Schizothorax nasus.

The Dongu.

Schizothorax nasus, *Heckel, Fische aus Kaschmir*, p. 33, tab. 6.

This species appears to be very closely allied to *Sch. intermedius*, from which it is, perhaps, specifically distinct in having a shorter anal fin.

D. 11. A. 8.

Scales minute. Mouth inferior, crescent-shaped, nearly horizontal, much broader than long; upper jaw somewhat pointed, much projecting beyond the lower; margin of the lower jaw sharpish; lower labial fold interrupted in the middle; barbels shorter than the eye. Origin of the dorsal fin midway between the root of the caudal and the end of the snout, opposite to that of the ventral. The osseous dorsal ray of moderate strength, armed with not very closely set teeth. Anal fin rather narrow and high, but shorter than the other fins, and not extending to the caudal when laid backwards. The height of the body is a little more than the length of the head, which is two-ninths of the total (without caudal). The length of the snout is much more than the diameter of the eye, which is one-sixth of the length of the head (in specimens 10–11 inches long). Anal scales moderately developed, the largest being half as broad as the orbit. (*Heck.*)

Cashmere.

8. Schizothorax longipinnis.

The Dapeghat.

Schizothorax longipinnis, *Heckel, Fische aus Caschmir*, p. 27, tab. 4.

D. 11. A. 8.

Scales minute. Mouth inferior, crescent-shaped, slightly obliquely ascending forwards, much broader than long, the upper jaw but little projecting beyond the lower; margin of the lower jaw sharpish; lower labial fold interrupted in the middle; barbels shorter than the eye, the anterior very short. Origin of the dorsal fin a little nearer to the root of the caudal than to the end of the snout, nearly opposite to the base of the ventral. The osseous dorsal ray is of moderate strength, armed with closely set teeth behind. Anal fin narrow, high, extending to the root of the caudal when laid backwards. The height of the body is equal to the length of the head, which is two-ninths of the total (without caudal). The length of the snout is not much more than the diameter of the eye, which is more than one-fifth of the length of the head (in specimens 9–10 inches long). Anal scales not much developed, the largest being less than half as broad as the orbit. (*Heck.*)

Cashmere.

9. Schizothorax esocinus.

The Cheroo.

Schizothorax esocinus, *Heckel, Fische aus Caschmir*, p. 48, tab. 9; *M'Clell. Calc. Journ. Nat. Hist.* ii. 1842, p. 579.

D. 11. A. 8.

Scales minute. Mouth slightly ascending forward, the upper jaw being but little longer than the lower, as broad as long; margin of the lower jaw not cutting, without cartilaginous covering. Head depressed, much elongate, with long snout; interorbital space flat. Lower labial fold interrupted in the middle; barbels longer than the eye. Origin of the dorsal fin somewhat nearer to the root of the caudal than to the end of the snout, opposite the root of the ventral. The osseous dorsal ray is strong, long, and armed with strong, closely set teeth. Anal fin narrow, reaching to the base of the caudal when laid backwards. The height of the body is two-elevenths of the total length (without caudal), the length of the head rather less than two-sevenths. Eye small. Anal scales moderately developed, the largest being half as broad as the orbit. Body with numerous blackish dots.

Cashmere and Afghanistan.

a. Ten inches long, stuffed. River Behut, Cashmere. Presented by H. Drummond, Esq.
b. Ten inches long, stuffed. Afghanistan. From Griffith's Collection.

10. Schizothorax hodgsonii.

Oreinus hodgsonii, *Günth. Proc. Zool. Soc.* 1861, p. 224.

D. 10. A. 7. L. lat. 155.

Snout very long, pointed, longer than the postorbital portion of the head. Mouth inferior, at least as long as broad; the upper jaw projecting beyond the lower, with a broad fleshy lip, which is subtriangular in front, and has a free margin above; margin of the lower jaw slightly compressed, with a thin, deciduous cartilaginous layer; lower labial fold broad, free in its entire circumference, produced into a short median lobe; barbels about as long as the eye. Origin of the dorsal fin in advance of the base of the ventral, and midway between the root of the caudal and the end of the snout. The osseous dorsal ray is strong, armed with very strong teeth. Anal fin narrow, reaching nearly to the base of the caudal when laid backwards. Caudal fin deeply forked. The height of the body is one-fifth of the total length (without caudal), the length of the head one-fourth. Interorbital space slightly convex, the profile of the head gradually passing into that of the back. Eye rather small, one-seventh of the length of the head. Anal scales but little developed, the largest being not quite half as broad as the orbit. Coloration uniform.

Nepal.

a. Type of the species, stuffed, 20 inches long. Presented by B. H. Hodgson, Esq.
b–f. Young. Presented by B. H. Hodgson, Esq.
? *g–h*. Very young. Simla. From the Collection of Messrs. von Schlagintweit.

11. Schizothorax ritchianus.

Schizothorax ritchieana, *M'Clell. Calc. Journ. Nat. Hist.* ii. 1842, p. 580.

D. 10. A. 7.

Scales minute. Mouth inferior, horseshoe-shaped, the upper jaw projecting beyond the lower. Lower lip with a broad fold, free in its entire circumference, and produced into a short median lobe. Origin of the dorsal fin opposite to that of the ventral, and somewhat nearer to the root of the caudal than to the end of the snout. Osseous dorsal ray rather feeble, with conspicuous teeth behind, its stiff portion being half as long as the head. Anal fin narrow, not reaching to the base of the caudal when laid backwards. The height of the body is one-fifth of the total length (without caudal), the length of the head two-ninths. Interorbital space flattish. Snout moderately produced, much longer than the eye, which is one-fifth of the length of the head. Anal scales moderately produced. Body spotted.

Affghanistan.

a. Nine inches long, stuffed. Helmund River. From Griffith's Collection.

Our specimen is the variety from the Helmund River with the small dorsal spine mentioned by M'Clelland. Not having a specimen of the true *Sch. ritchieana* for comparison, I have not thought myself justified to propose a distinct name for the variety.

12. Schizothorax barbatus.

Schizothorax barbatus, *M'Clell. Calc. Journ. Nat. Hist.* ii. 1842, p. 580.

D. 12. A. 8.

Scales minute. Mouth inferior, horseshoe-shaped, nearly horizontal, scarcely longer than broad; upper jaw projecting beyond the lower; margin of the lower jaw sharpish, its inside covered with a deciduous cartilaginous layer; lower labial fold broad, with a free continuous margin in its entire circumference; barbels as long as, or even longer than, the eye. Origin of the dorsal fin a little nearer to the root of the caudal than to the end of the snout, opposite to the root of the ventrals. The osseous dorsal ray exceedingly strong, not much shorter than the head, armed with very strong, closely set teeth behind. Anal fin narrow, rather high, but not extending to the root of the caudal if laid backwards. The height of the body is one-fifth of the total length (without caudal), the length of the head two-ninths. Interorbital space scarcely convex. Snout produced, much longer than the diameter of the eye, which is one-fifth of the length of the head in a specimen 11 inches long. Anal scales but little developed.

Cabul River.

a–b. Types of the species, 11 and 7 inches long: stuffed and skin. Jullalabad. From Griffith's Collection.

The small size of the scales induces me to believe that the following species belongs to this genus rather than to *Barbus*:—

13. Schizothorax (?) microlepis.

Barbus microlepis, *Keyserling, Zeitschr. ges. Ntrwiss.* xvii. p. 7, taf. 1.

D. 12. A. 8.

Lateral line formed by 108 scales. The height of the body is less than the length of the head, which is one-fourth of the total (without caudal); head rather low, with the snout produced, the upper jaw being longer than the lower. The origin of the dorsal fin is in advance of that of the ventral, and midway between the end of the snout and the root of the caudal. The osseous dorsal ray is very strong and serrated. Anal fin small. (*Keys.*)

River near Anardareh, between Herat and Lasch.

Barbus miliaris, De Filippi, Viagg. in Persia, p. 358, observed near Teheran, is not sufficiently well described to enable us to point out the specific differences between it and *B. microlepis*. It would appear to have the dorsal fin placed somewhat more backwards, its origin being above the root of the ventrals. L. lat. 92.

26. PTYCHOBARBUS.

Ptychobarbus, *Steindachner, Verh. zool.-bot. Ges. Wien*, 1866, p. 789.

Body covered with very small scales; lateral line running along the middle of the tail. Dorsal fin without osseous ray, opposite to the ventrals; anal fin very short. A deep groove runs from the dorsal to the caudal fin. Snout conical; mouth inferior, arched; mandibles of usual length and width. A barbel at the angle of the mouth. Vent and anal fin in a scaly sheath. Pharyngeal teeth compressed, 4 . 3—3 . 4.

Tibet.

1. Ptychobarbus conirostris.

Steindachner, l. c. p. 790, taf. 17. fig. 4.

D. 11. A. 8. V. 10. L. lat. ca 100.

The height of the body is contained nearly six times in the total length (without caudal), the length of the head four times and one-sixth. Snout much longer than the eye, the diameter of which is one-fourth or one-fifth of the length of the head; barbel at least as long as the eye. The root of the ventral is opposite to the posterior part of the dorsal fin, the origin of which is a little nearer to the end of the snout than to the root of the caudal. Body and fins with numerous small irregular blackish spots. (*Steindachner.*)

Hanle (Tibet).

27. GYMNOCYPRIS.

Body nearly entirely naked; lateral line running along the middle of the tail. Dorsal fin without osseous ray, opposite to the ventrals;

anal fin very short; caudal forked. Structure of the mouth without any peculiarities; cleft of the mouth arched, anterior, with the jaws subequal in length. Barbels none. Vent and anal fin in a scaly sheath. Gill-opening rather narrow, the attachment of the gill-membrane to the isthmus takes place opposite to the præopercular angle. Pharyngeal teeth conical, 4 . 3—2 . 4. Peritoneum black.

Habitat —— ?

1. Gymnocypris dobula.

D. 11. A. 8. V. 10. Vert. 47.

The height of the body is somewhat less than the length of the head, which is nearly one-fourth of the total (without caudal). Snout of moderate length; the maxillary extends to below the front margin of the orbit. The width of the interorbital space equals the length of the snout; the diameter of the eye is contained six times and a half in the length of the head, and once and two-thirds in that of the snout. Suborbital ring very narrow. The origin of the dorsal fin is a little nearer to the end of the snout than to the root of the caudal, and considerably in advance of the base of the ventral. Anal fin twice as high as long. Pectoral rounded, terminating at a great distance from the ventral, the hind margin of which is subtruncate. There are a few scales in the humeral region and on the commencement of the lateral line. The anal sheath is formed by large scales; the remainder of the body is naked. Greenish above, silvery below.

Habitat —— ?

a. Eleven and a half inches long. From the Haslar Collection.

28. SCHIZOPYGOPSIS.

Schizopygopsis, *Steindachner, Verh. zool.-bot. Ges. Wien*, 1866, p. 785.

Body nearly entirely naked, only a few scales in the scapular region; lateral line running along the middle of the tail. Dorsal fin with a serrated ray, opposite to the ventrals; anal fin very short; caudal deeply forked. Snout obtusely conical; mouth inferior, transverse, slightly produced backwards on the sides; lower jaw with a cutting anterior edge, covered with a horny sheath, and with a short lateral lip continuous with the upper lip; barbels none. Vent and anal fin in a scaly sheath. Pharyngeal teeth compressed, 4 or 3 . 3—3 . 3 or 4.

Tibet.

1. Schizopygopsis stolickæ.

Steindachner, *l. c.* p. 786, taf. 16. fig. 2.

D. 11. A. 7. V. 9.

Similar in form to a Barbel. Base of the ventral fins below the posterior part of the dorsal fin, the origin of which is midway between the end of the snout and the root of the caudal. Olive-coloured, with irregular blackish specks.

Tibet.

a. Five inches long. Gnari Khorsum. From the Collection of Messrs. von Schlagintweit.
b. Four inches long. Ladak. From the Collection of Messrs. von Schlagintweit.
c. Ten inches long. Delhi (?). From the Collection of Messrs. von Schlagintweit.

29. DIPTYCHUS.

Diptychus, *Steindachner, Verh. zool.-bot. Ges. Wien*, 1866, p. 787.

Only the sides of the body and tail are more or less covered with very small scales; lateral line running along the middle of the tail. Dorsal fin without osseous ray, opposite the ventrals; anal fin very short; caudal forked. Snout obtuse, mouth inferior, curved; lower jaw with a cutting anterior edge covered with a horny sheath, behind which is a distinct, uninterrupted labial fold, continuous with the upper lip. A barbel at the angle of the mouth. Vent and anal fin in a scaly sheath. Gill-opening rather narrow, the attachment of the gill-membrane to the isthmus takes place behind the præopercular angle. Pharyngeal teeth compressed, 4 . 3—3 . 4.

Himalayas; Tibet.

1. **Diptychus maculatus**

Steindachner, l. c. p. 788, taf. 13. fig. 5.

D. 11. A. 7. V. 9.

Body elongate, its depth being less than the length of the head, which is contained four times and one-fourth in the total (without caudal). Eye of moderate size, two-ninths or one-fifth of the length of the head. Pectoral as long as the head, without snout. Barbel not quite as long as the eye. The root of the ventral fin is opposite to the last ray of the dorsal fin, the origin of which is somewhat nearer to the end of the snout than to the root of the caudal. Olive-coloured above, with indistinct darker spots.

Himalayas; Tibet.

a. Three inches long. Darche (Lahol, Himalaya). From the Collection of Messrs. von Schlagintweit.

30. AULOPYGE.

Aulopyge, *Heckel, in Russegger's Reisen*, i. p. 1021.

Body naked; lateral line running along the middle of the tail. Dorsal fin short, with a serrated spine opposite the ventral fins; anal fin very short; caudal forked. Mouth inferior, crescent-shaped, the lower jaw with a continuous lip. Barbels four. Pharyngeal teeth compressed, 4–4. Intestinal tract with only a few convolutions. Female with the urogenital tube and vent attached to the anal fin.

Dalmatia.

1. Aulopyge hügelii.

Heckel, l. c.; *Heckel & Kner, Süsswasserf.* p. 95, figs. 47, 48.

D. 10. A. 7. V. 9.

Snout elongate, conical. The length of the head is two-sevenths of the total (without caudal). Barbels short, not longer than the small eye. Body with irregular blackish-brown specks.

Dalmatia and Bosnia.

a. Adult female. Purchased of Dr. J. Heckel.

b–d. Adult and young. Cettina River. Purchased of the Milan Museum.

31. GOBIO.

Gobio, *Cuv. Règne Anim.*

Scales of moderate size; lateral line present. Dorsal fin short, without spine, opposite to the ventrals. Anal fin short. Mouth inferior; mandible not projecting beyond the upper jaw when the mouth is open; both jaws with simple lips; a small but very distinct barbel at the angle of the mouth, quite at the extremity of the maxillary. Gill-rakers very short; pseudobranchiæ. Pharyngeal teeth 5 . 3 or 2—2 or 3 . 5, hooked at the end.

Europe.

1. Gobio fluviatilis.

The Gudgeon. Der Grässling, Gründling. Sandkrypare (Swed.). Le Goujon. Gobione.

Gobius fluviatilis, *Rondel. De Pisc. Fluv.* p. 206; *Gesner*, p. 399; *Marsil. Danub.* iv. tab. 9. f. 2.

Cyprinus, sp., *Artedi*, *Genera*, p. 4. no. 10, *Species*, p. 13. no. 5, and *Synon.* p. 11. no. 20; *Gronov. Zoophyl.* no. 329.

Cyprinus gobio. *L. Syst. Nat.* i. p 526; *Bloch, Fische Deutschl.* p. 57, tab. 8. fig. 2; *Bl. Schn.* p. 448; *Lacép. Poiss.* v. p. 533; *Donov. Brit. Fish.* iii. pl 71; *Meidinger*, tab. 23; *Pallas, Zoogr. Ross.-As.* iii. p. 295; *Agassiz, in Isis*, 1828, p. 1049, taf. 12. fig. 2, *a–d*; *Jenyns, Man.* p. 405; *Jurine, Poiss. du Lac Lem.* p. 217, pl. 14; *Gronov. Syst.* ed. *Gray*, p. 178.

Enchelyopus, sp., *Klein, Miss.* iv. p. 60. no. 5, tab. 15. fig. 5.

Duhamel, Pêches, iii. p. 497, pl. 23. fig. 7.

Cyprinus (olivac. maculis fuscis distinctus), *Lepechin. Nov. Comm. Acad. Petropol.* 1771, p. 491.

Gudgeon, *Pennant, Brit. Zool.* iii. p. 310; or ed. 1812, iii. p. 476; *Couch, Brit. Fish.* iv. p. 20, pl. 182.

Gobio fluviatilis, *Fleming, Brit. An.* (1828) p. 186; *Cuv. & Val.* xvi. p. 300, pl. 481; *Agassiz, Mém. Soc. Sc. Nat. Neuch.* i. p. 36; *Bonap. Faun. Ital. Pesc.* c. fig.; *Nills. Skand. Fauna*, iv. p. 300; *Sélys-Longchamps, Faun. Belge*, p. 194; *Yarrell, Brit. Fish.* i. p. 325; 2nd edit. i. p. 371, and 3rd edit. i. p. 383; *Kröyer, Danm. Fisk.* iii. p. 334; *Nordmann, in Demid. Voy. Russ. Mérid.* iii. p. 472; *Rapp, Fische d. Bodensee's*, p. 10; *Kessler, Bull. Soc. Nat. Mosc.* xxxii. 1859, p. 529; *Jeitteles, Fische d. March*, i. 1863, p. 28; *Dybowski, Cypr. Livlands*, p. 72; *Siebold, Süsswasserf.* p. 112; *Malmgren, Wiegm. Arch.* xxx. p. 311; *Canestrini, Arch. per la Zoolog.* iv. 1866, p. 80; *Blanchard, Poiss. France*, p. 293.

Gobio venatus, *Bonap. Faun. Ital. Pesc.*

Gobio obtusirostris, *Cuv. & Val.* xvi. p. 311.
—— lutescens, *De Filippi, Cenni*, p. 7.
—— vulgaris, *Heckel & Kner, Süsswasserf.* p. 90. figs. 42 & 43.
Leuciscus gobio, *Günth. Fische d. Neckars*, p. 44.
Gobio pollinii, *De Betta, Ittiol. Veron.* p. 77.
—— benacensis, *Ninni, Cenni*, p. 42.

D. 10. A. 8. V. 8. L. lat. 40–44. L. transv. $6\frac{1}{2}/6\frac{1}{2}$.
Vert. 37–41 (21/18).

The height of the body is one-fifth or nearly one-fifth of the total length (without caudal). Tail compressed. Snout obtuse, with the upper profile convex; eye a little behind the middle of the length of the head (in adult specimens). Barbels not extending beyond the centre of the eye (in adult examples), frequently shorter. A series of round blackish spots along the lateral line, sometimes confluent posteriorly. Dorsal and caudal fins with transverse series of black dots.

Temperate parts of Europe.

a–c. Adult. Lough Neagh, Ireland. Presented by L. Conyngham, Esq.
d–e. Skins. Scotland. From Mr. Parnell's Collection.
f–g. Adult. London. From Yarrell's Collection.
h. Adult. Holland. From Dr. Bleeker's Collection.
i. Large specimen. Rhine. Presented by J. Gould, Esq.
k. Adult. River Main. Presented by Dr. A. Günther.
l–m. Half-grown. River Main. Presented by Prof. v. Siebold.
n. Many adult and young specimens. Neckar. From the Stuttgart Collection.
o–q. Half-grown. River Isar. Presented by Prof. v. Siebold.
r, s–v. Adult and half-grown. Danube.
w. Adult: skin. River Ticino. Presented by T. C. Eyton, Esq.
x–y. Half-grown. River Rieka (Montenegro). From the Milan Museum.
z. Skull. River Ahr (Rhenish Prussia). From Dr. A. Günther's Collection.

2. Gobio uranoscopus.

Gobius fluviatilis minor, *Willughby, Hist. Pisc.* p. 264; *Artedi, Synon.* p. 11. no. 21.
Cyprinus uranoscopus, *Agass. Isis*, 1828, p. 1048, tab. 12. fig. 1 *a–d*, and 1829, p. 44.
Gobio uranoscopus, *Cuv. & Val.* xvi. p. 312; *Heckel & Kner, Süsswasserf.* p. 93. figs. 45 & 46; *Siebold, Süsswasserf.* p. 115.

D. 10. A. 8. V. 8. L. lat. 40–42. L. transv. $6\frac{1}{2}/7\frac{1}{2}$.

The height of the body is one-sixth, or nearly one-sixth of the total length (without caudal). Tail scarcely compressed, subcylindrical. Snout somewhat pointed, with the upper profile nearly straight; eye behind the middle of the length of the head (in adult specimens). Barbels extending to or beyond the hind margin of the orbit. Dorsal and caudal fins with one, two, or three transverse series of blackish dots.

Rivers Isar, Salzach, Save, and Idria.

a–c, *d–g*. Adult and half-grown. River Isar. Presented by Prof. L. Agassiz and Prof. v. Siebold.

This species has seven branched rays in the dorsal fin, and five in the anal. Kessler (Naturgesch. des Kijew'schen Lehrbezirks, Heft vi. p. 30) mentions this fish from the river Dniester, near Mohilew, but says that it is distinguished from the western form in having one branched ray more in the dorsal and anal. Dybowski (Cypr. Livlands, p. 71) regards this as a specific difference, naming the form from the Dniester *Gobio kessleri*.

32. PSEUDOGOBIO*

Pseudogobio, *Bleek. Atl. Ichthyol. Cypr.* p. 29.
Sarcocheilichthys, *Bleek. Cypr. Prodr.* p. 426.

Scales of moderate size; lateral line present. Dorsal fin short, without spine, with its anterior portion in advance of the ventrals; anal fin short. Mouth inferior, both jaws with more or less dilated lips; a small barbel at the angle of the mouth is sometimes absent. Gill-rakers rudimentary; pseudobranchiæ very small. Pharyngeal teeth 5–5, hooked at the end.

China; Japan; Formosa.

The propriety of separating this genus from *Gobio* might be questioned; yet, according to Bleeker's system, it enters not only another family, but a distinct section, *Gobio* being referred to the *Leuciscini*, and *Pseudogobio* to the *Paralabeonini*. It is true it is not very evident, from the characters given, how these two sections are at all distinct from each other.—The species may be referred to two sections:—

α. Barbels present: *Pseudogobio*, Blkr., p. 174.
β. Barbels none: *Sarcochilichthys*, Blkr., p. 175.

α. *Barbels present*: Pseudogobio, *Blkr.*

1. **Pseudogobio brevirostris.**

D. 10. A. 8. V. 8. L. lat. 38–39. L. transv. 5/5.

The height of the body is one-sixth of the total length (without caudal), the length of the head one-fifth. Snout obtuse, with the upper profile arched, short, not much longer than the diameter of the eye, which is one-third of the length of the head. Mouth inferior, small; jaws with broad lips, the inferior being indistinctly three-lobed, the upper fimbriated, and terminating in a very short barbel at the angle of the mouth. Præorbital an isosceles triangle, with the point directed forwards, united by a broad suture with the succeeding suborbital, which, like the following, is much broader than the fleshy portion of the cheek underneath. The origin of the dorsal fin is much nearer to the end of the snout than to the root of the caudal; ventrals inserted below the hinder half of the dorsal.

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* 1. Gobio rivularis, *Basilewsky, in Mém. Soc. Nat. Mosc.* x. 1855, p. 231; Gobio heterodon, *Bleeker, Ned. Tydschr. Dierk.* ii. 1864, p. 26.

Caudal fin moderately forked. Pectoral long, much longer than the head, and extending to or somewhat beyond the origin of the dorsal. Back minutely dotted with black. A bluish band, silvery below, along the lateral line. Dorsal caudal, and pectoral fins with transverse series of blackish dots.

Formosa.

a–e. From 3 to 3½ inches long. From Consul Swinhoe's Collection.

2. Pseudogobio esocinus.

Gobio esocinus, *Schlegel, Faun. Japon. Poiss.* p. 196, pl. 99. fig. 2.
Pseudogobio esocinus, *Bleek. l. c.*

D. 10. A. 9. V. 8. L. lat. 37–38. L. transv. 5/4½.

The height of the body is one-fifth or one-sixth of the total length (without caudal), the length of the head one-fourth or two-sevenths. Snout much produced, the eye being behind the middle of the length of the head. Barbels about as long as the eye. A series of round blackish spots along the lateral line. Dorsal and caudal fins with transverse series of black dots.

Japan.

a. Half-grown. From the Leyden Museum

3. Pseudogobio sinensis.

Tylognathus sinensis, *Kner, Novara, Fische,* p. 354, taf. 15. fig. 5.

D. 9. A. 7. V. 8. L. lat. 36–37. L. transv. 6 5.

The length of the head is one-fourth of the total length (without caudal)*. Snout of moderate extent, with the upper profile concave. The diameter of the eye is one-fourth of the length of the head, and two-thirds of that of the snout. Mouth inferior, small; lower jaw with pendent lateral lips. Origin of the dorsal fin nearer to the end of the snout than to the root of the caudal. Caudal fin emarginate. The pectoral fins reach to the ventrals, and the ventrals beyond the vent. A blackish spot at the root of the caudal. Two series of spots across the dorsal, and three oblique series on each caudal lobe. (*Kner.*)

Shanghai.

This species appears to form a passage to *Ps. variegatus,* to which it is evidently closely allied.

β. Barbels none: Sarcochilichthys, *Blkr.*

4. Pseudogobio variegatus.

Leuciscus variegatus, *Schleg. Faun. Japon. Poiss.* p. 213, pl. 102. fig. 2.
Sarcochilichthys variegatus, *Bleek. l. c.* (name only).

D. 9. A. 8. L. lat. 43. L. transv. 5/5.

The height of the body is one-fourth of the total length (without caudal), the length of the head two-ninths. Snout of moderate extent, with the upper profile convex. The diameter of the eye is one-fourth of the length of the head. Mouth inferior, horseshoe-shaped; lower jaw with pendent lateral lips. Origin of the dorsal fin nearer to the end of the snout than to the root of the caudal. Caudal fin emarginate. A small black spot behind the humerus.

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* The height of the body is said to be much less than the length of the head: according to the figure it is at least equal to it.

Pharyngeal teeth 5–5. Gill-opening extending to below the middle of the operculum.

Japan.

I am indebted to Dr. Bleeker for a more precise knowledge of this fish, the typical specimens having been examined by him in the Leyden Museum at my request.

33. CERATICHTHYS*.

Ceratichthys, *Baird & Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 212.

Scales of moderate or small size; lateral line present. Dorsal fin short, without spine. not, or but slightly, in advance of the ventrals. Anal fin short. Mouth subinferior; the lower jaw does not project beyond the upper when the mouth is open; intermaxillaries protractile from below the maxillaries; both jaws with thickish lips; a small barbel at the angle of the mouth, quite at the extremity of the maxillary. Gill-rakers very short and few in number; pseudobranchiæ. Pharyngeal teeth 4—4, hooked at the end (sometimes 4.1—1.4).

North America.

1. Ceratichthys cataractæ.

Gobio cataractæ, *Cuv. & Val.* xvi. p. 315, pl. 483.

D. 9. A. 8. L. lat. 70.

The height of the body is about one-sixth of the total length (without caudal); eye situated somewhat before the middle of the length of the head. Barbels small. The origin of the dorsal fin is midway between the end of the snout and the root of the caudal, and behind that of the ventrals. (*Val.*)

Falls of the Niagara.

2. Ceratichthys plumbeus.

Gobio plumbeus, *Agassiz, Lake Superior*, p. 366.
Leucosomus plumbeus, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 189.

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* 1. Ceratichthys leptocephalus, *Girard, l. c.* p. 213.—Salem, N. C.
2–4. Gobio gelidus, *Girard, in Proc. Ac. Nat. Sc. Philad.* 1856, p. 188, and *in U. S. & Mex. Bound. Fish.* pl. 29. figs. 5–9, from the Milk River, Upper Missouri; Gobio æstivalis, *Girard, l. c.* p. 189, and *in U. S. & Pac. R. R. Exped. Ichthyol.* pl. 57. figs. 17–19, from the Rio San Juan, New Leon; and Gobio vernalis, *Girard, l. c.* and *in U. S. Pac. R. R. Exped. Ichthyol.* p. 249, from the Arkansas River, are insufficiently described, and accompanied by notoriously unreliable figures, so that they cannot be admitted into the system until their characters are better defined by a reexamination of the typical examples.

Ceratichthys prosthemius, *Cope, Journ. Ac. Nat. Sc. Philad.* xiii. p. 365, pl. 11. fig. 4.

D. 9. A. 8. L. lat. 60. L. transv. 11/12.

The height of the body is about equal to the length of the head, and two-ninths of the total (without caudal); the diameter of the eye is equal to the length of the snout, and nearly one-fourth of the length of the head. Barbels small. The origin of the dorsal fin is midway between the end of the snout and the root of the caudal, and a little behind that of the ventrals. There are eight longitudinal series of scales between the lateral line and the root of the ventral fin. An indistinct blackish band runs along the middle of the side, terminating in a small black spot at the root of the caudal fin. This band appears to be more or less entirely lost with age, but is very distinct in young examples. Pharyngeal teeth 4 . 1—1 . 4.

Lake Superior.

a. Half-grown. Lake Superior. Presented by Th. Moore, Esq.

3. Ceratichthys dissimilis.

Leuciscus dissimilis, *Kirtland, Bost. Journ. Nat. Hist.* iii. p. 341, pl. 4. fig. 2.

Ceratichthys dissimilis, *Cope, Proc. Ac. Nat. Sc.* 1864, p. 277; *Journ. Ac. Nat. Sc. Philad.* xiii. p. 368, pl. 12. fig. 1.

D. 10. A. 8. L. lat. 47. L. transv. $6\frac{1}{2}/7\frac{1}{2}$.

Barbel minute. The eye occupies the middle of the length of the head, and is not much shorter than the snout. The height of the body is contained five times and one-half in the total length (without caudal), the length of the head four times. The origin of the dorsal fin is a little nearer to the end of the snout than to the root of the caudal. There are three and a half longitudinal series of scales between the lateral line and the root of the ventral fin. A greyish-silvery band runs from the snout to the root of the caudal; a series of round darker spots along this band.

Pennsylvania; Mahoning River; Lake Erie.

a–b. Youghiogheny River. Purchased of Mr. Salvin.

4. Ceratichthys cumingii.

D. 10. A. 9. V. 7. L. lat. 45. L. transv. 6/6.

Barbels minute. The eye is situated entirely in the anterior half of the length of the head, and nearly as long as the snout, which is obtuse, rounded, convex, the mouth being subinferior. The length of the head is contained four times and one-third in the total (without caudal), the height of the body five times. Interorbital space convex, as wide as the orbit; suborbital ring extremely narrow. The origin of the dorsal fin is a little behind that of the ventrals, and somewhat nearer to the root of the caudal than to the end of the snout. Pectoral not reaching the ventral. There are four longitudinal series of scales between the lateral line and ventral fin. A greyish-silvery band runs from the gill-opening to the root of the caudal, where it terminates in a black spot.

California.

a–b. Three inches long. Purchased of the late Mr. H. Cuming.

5. Ceratichthys biguttatus.

Semotilus biguttatus, *Kirtland, Bost. Journ. Nat. Hist.* iii. 1840, p. 344, pl. 5. fig. 1 (bad).
Leuciscus biguttatus, *Dekay, New York Fauna, Fish.* p. 214; *Storer, Synopsis*, p. 161.
Ceratichthys biguttatus, *Baird & Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 213; *Cope, Journ. Acad. Nat. Sc. Philad.* xiii. p. 366, pl. 11. fig. 5.

D. 9. A. 8. L. lat. 40. L. transv. $6\frac{1}{2}/7\frac{1}{2}$.

Mouth subinferior. Barbel very small, half as long as the eye. The eye occupies the middle of the length of the head, and is about one-half of the extent of the snout. The height of the body is contained four times and one-fourth or four times and one-third in the total length (without caudal), the length of the head thrice and three-fourths or thrice and four-fifths. The origin of the dorsal fin is a little nearer to the root of the caudal than to the end of the snout. There are four and a half longitudinal series of scales between the lateral line and the root of the ventral fin. A very indistinct dark band along the middle of the side of the tail.

United States

a–c. Adult. Susquehanna River. Purchased of Mr. Salvin.
d. Adult (head with tubercles). Ohio. Presented by Th. Moore, Esq.
e–f. Adult, skins. Ohio. Purchased of Mr. Parnell.
g. Adult (head with tubercles). Purchased of Mr. Cope as *Photogenis scabriceps*.

6. Ceratichthys cyclotis.

Cope, Proc. Acad. Nat. Sc. Philad. 1864, p. 277.

D. 10. A. 9. L. lat. 41. L. transv. 7/?.

"Body much compressed, dorsally flat; the height four times and two-fifths in total length. Muzzle obtuse, rounded; head entering four times and one-third in length (to emargination of caudal); anterior base of dorsal measures one-half the distance from end of muzzle to base of tail; lateral line nearly straight; operculum rounded posteriorly, scarcely concave above. Eye contained five times and one-half in length of head. Dermal head tubercles longest on vertex, smallest on muzzle, in four alternating rows, one on each side becoming superciliary. The dorsal and anal are much prolonged posteriorly, the greatest horizontal length of the former nearly equalling the length of the upper surface of the head. Colour of upper surfaces olive-brown; below, from above lateral line, yellowish; præopercular region rosy; pectorals slightly dusky, otherwise no fin-markings."

Michigan and Kansas.

This species is said to have sometimes an additional tooth in a second series of pharyngeals.

7. Ceratichthys stigmaticus.

Cope, Proc. Acad. Nat. Sc. Philad. 1864, p. 278.

D. 9. A. 8. L. lat. 40. L. transv. 7/?.

"Dorsal outline rising gradually from end of muzzle to base of dorsal fin; muzzle projecting a little beyond premaxillary outline. Head (equal greatest depth) four times and a half in total length; eye thrice and one-third in length of head, its superior rim upon the frontal plane. Fins short; ventrals a little anterior to dorsal, not reaching the vent. [Distance] from base of caudal to anterior base of dorsal equal from latter to posterior nares. General colour reddish, operculum and cheeks more silvery; a brown band from muzzle to eye, and a very distinct spot at base of tail. Total length 2½ inches. Pharyngeal bones stout, the superior limb broad; teeth 4 . 1—1 . 4. Barbel on the end of the maxillary."

Michigan.

8. Ceratichthys micropogon.

Cope, Proc. Acad. Nat. Sc. Philad. 1864, p. 277; or *Journ. Acad. Nat. Sc. Philad.* xiii. p. 366, pl. 12. fig. 2.

D. 9. A. 8. L. lat. 40. L. transv. 6/?.

"The appearance of the head of this fish is that of a *Hypsilepis* rather than of *Ceratichthys*; and the difficulty of discerning the minute barbels increases the liability to err in determining its affinities. Upper jaw scarcely overlapping the lower; mouth slightly oblique, angle opposite anterior border of orbit; latter enters thrice and one-fourth in length of head, which is measured thrice and three-fourths in length from muzzle to base of tail; the greatest depth is measured four times and one-fourth in the same distance. Head broad, muzzle obtuse, profile rounded, descending; caudal peduncle long. Length from origin of tail to anterior base of dorsal equal from dorsal to posterior nostril. Above pale yellowish brown; a broad brown shade from end of muzzle to base of tail; below pale yellowish."

Conestoga River.—Length 3½ inches.

9. Ceratichthys hyalinus.

Ceratichthys hyalinus, *Cope, MS.*

D. 10. A. 9. L. lat. 41. L. transv. 6/5.

Mouth inferior, horizontal, the upper jaw protruding beyond the lower. Barbels small, but very conspicuous. Eye very large, more than one-third of the length of the head, and rather longer than the snout. The height of the body is one-fifth of the total length (without caudal), the length of the head one-fourth. Origin of the dorsal fin midway between the end of the snout and the root of the caudal, and opposite to the origin of the ventral. Caudal fin deeply forked.

Caudal peduncle elongate. The pectoral fin does not extend to the ventral. There are three longitudinal series of scales between the lateral line and ventral fin. A broad silvery band, sometimes tinged with black, runs along the side of the head and body; back and belly with scarcely any colour.

Pharyngeal teeth 4 . 1—1 . 3.

Holston River, Virginia.

a–c. Three inches long. From Mr. Cope's Collection.

34. BUNGIA.

Bungia, *Keyserling, Zeitschr. ges. Ntrwiss.* xvii. p. 18.

Scales of moderate size, lateral line complete. Dorsal fin short, without spine, commencing in advance of the ventrals; anal fin very short. Mouth anterior, lips thin; barbels two. Pharyngeal teeth slightly hooked, conical, 5–5. Intestinal tract as long as the body.

Persia.

1. Bungia nigrescens.

Keyserling, l. c. taf. 8.

D. 10. A. 8. V. 8. L. lat. 41. L. transv. 6/?.

The height of the body is nearly equal to the length of the head, which is a little less than one-fourth of the total (without caudal). The eye is one-fifth of the length of the head, and occupies its middle. Cleft of the mouth oblique, the lower jaw being slightly the shorter; barbels longer than the eye. Origin of the dorsal fin nearer to the end of the snout than to the root of the caudal, which is emarginate. There are four longitudinal series of scales between the lateral line and the root of the ventral. Coloration uniform; dorsal and caudal rays with blackish dots. (*Keys.*)

River Heri-Rud, near Herat. Five inches long.

35. PIMEPHALES*.

Pimephales†, (*Raf.*) *Agass. Sill. Journ.* 1855, xix. p. 220.

Scales of moderate size; *lateral line* present, but *incomplete. Dorsal fin short, with a short, feeble spinous ray in front,* commencing above the ventrals; anal fin short. Mouth anterior, narrow; intermaxillaries protractile; the labial fold of the lower jaw is developed on the sides only, not extending across the symphysis; barbels none; edge of the jaws not sharp, covered (in males?) with a deciduous horny cover. Gill-rakers short; pseudobranchiæ. The attachment of the gill-membrane to the isthmus takes place opposite to the angle of the præoperculum. Pharyngeal teeth compressed 4–4; the upper and lower short caudal rays united by a broadish interradial membrane. Intestinal tract with but a few convolutions.

United States.

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* 1. Pimephales agassizii, *Cope, Journ. Ac. Nat. Sc. Philad.* xiii. p. 394.—Indiana.

† Corrupted from *Pimelocephalus*! See *Agass. l. c.*

1. Pimephales promelas.

Pimephales promelas, (*Raf.*) *Kirtland, Bost. Journ. Nat. Hist.* iii. p. 475, pl. 27. fig. 2; *Agass. Sill. Journ.* 1855, xix. p. 220.
? Pimephales maculosus, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 180; or *in U. S. Pac. R. R. Exped. Fish.* p. 234.
Pimephales fasciatus, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 180; or *in U. S. Pac. R. R. Exped. Fish.* p. 234.
Plargyrus melanocephalus, *Abbott, Proc. Ac. Nat. Sc. Philad.* 1860, p. 325.

D. 1/7. A. 8. V. 8. L. lat. 45–46. L. transv. 9/9.

Similar to a Minnow in general appearance; snout short, blunt, convex, scarcely longer than the diameter of the eye, which is one-fourth of the length of the head; the latter is one-fourth of the total length (without caudal). Interorbital space flattish, broad; suborbitals very narrow. The origin of the dorsal fin is a little behind that of the ventral, and equidistant between the end of the snout and the root of the caudal, or somewhat nearer to the latter. Ventral fin extending to or somewhat beyond the vent; caudal fin emarginate. There are five longitudinal series of scales between the lateral line and ventral fins. Head black (in adult males); dorsal fin with a blackish spot in front and behind.

This species appears to vary considerably in form according to sex, age, and, probably, season. Adult males are stouter than females, which have a narrower tail. Males have the snout covered with large circular grooves.

United States.

a–d. Adult. Mankato, Minn. Purchased of O. Salvin, Esq.

2. Pimephales milesii.

Cope, Proc. Ac. Nat. Sc. Philad. 1864, p. 282.

D. 1/9. A. 8. L. lat. 40. L. transv. 7/?.

Mouth oblique; the diameter of the eye is two-ninths of the length of the head, which is one-fourth of the total (without caudal). Ventral fins reaching to anal; origin of the dorsal fin a little nearer to the base of the caudal than to the end of the snout. Three longitudinal series of scales between the lateral line and base of ventral. Body with a faint blackish longitudinal line. (*Cope.*)

Grosse Isle; Detroit River.

36. HYBORHYNCHUS.

Hyborhynchus, *Agass. Amer. Journ. Sc. & Arts*, 1855, xix. p. 222.

This genus differs from *Pimephales* in having the lateral line complete.

United States.

1. Hyborhynchus notatus.

Agassiz, l. c.; *Cope, Journ. Ac. Nat. Sc. Philad.* xiii. p. 392, pl. 13. fig. 5.

D. 1/8. A. 8. V. 8. L. lat. 45. L. transv. $\frac{5 \text{ or } 6}{5.}$

The height of the body is from one-fifth to one-seventh of the total length (without caudal), the length of the head two-ninths. Snout blunt, with the upper profile descending in a strong curve, as long as the eye. Mouth small, inferior. The diameter of the eye is rather more than one-fourth of the length of the head; suborbital ring very narrow; interorbital space flat, its width being more than the diameter of the eye, and two-fifths of the length of the head. The origin of the dorsal fin is a little behind that of the ventrals, and midway between the end of the snout and the root of the caudal fin; upper margin of the dorsal fin rather convex; ventral fin extending to the vent; caudal fin forked. There are two and a half longitudinal series of scales between the lateral line and the ventral fin; a faint blackish longitudinal stripe along the lateral line.

Canada; United States.

a. Three and a half inches long; snout tubercular. Montreal. Purchased of Mr. Wright.
b. Several specimens. Kenhawa River. Purchased of Mr. Cope.
c. Adult; snout tubercular; tail deformed. Kenhawa River. Purchased of Mr. Cope as *Hyborhynchus superciliosus*.

37. CAMPOSTOMA [*].

Campostoma, *Agass. Amer. Journ. Sc. & Arts*, 1855, xix. p. 218; *Cope, Journ. Ac. Nat. Sc. Philad.* xiii. pp. 356, 393

Scales of moderate or small size; lateral line running along the middle of the tail. Dorsal fin short, without spinous ray, commencing nearly opposite the ventrals; anal fin short. Mouth inferior, narrow; intermaxillaries slightly protractile. Lower jaw with a sharp edge; barbels none: gill-rakers extremely short and fine; pseudobranchiæ. The attachment of the gill-membrane to the isthmus takes place behind the præoperculum. Air-bladder enveloped by the numerous convolutions of the intestinal canal, which is long (*Mesocysti*, Cope). Pharyngeal teeth 4—4, compressed.

United States.

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[*] 1. Campostoma formosulum, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 176; or *U. S. & Mex. Bound. Ichthyol.* p. 41, pl. 25. figs. 5–8.—Rio Sabinal, Texas.
2. —— nasutum. *Girard, ll. cc.* figs. 9–12.—New Leon, Mexico.
3. Hybognathus placitus, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 182; or *U. S. & Pac. R. R. Exped. Fish.* p. 236.—Campostoma placitum, *Cope, Proc. Ac. Nat. Sc. Philad.* 1864, p. 284 (name only).—Arkansas.
4. Campostoma mormyrus. *Cope, l. c.*—Bruce, Macomb County.
5. —— gobioninum, *Cope, l. c.*—Bruce, Macomb County and Grosse Isle.
6. —— hippops, *Cope, l. c.*—Platte River

1. Campostoma dubium.

Exoglossum dubium, *Kirtland, Journ. Bost. Soc. Nat. Hist.* v. p. 272, pl. 21. fig. 1

—— spinicephalum, *Cuv. & Val.* xvii. p. 489.

Leuciscus prolixus, *Storer, Proc. Bost. Soc. Nat. Hist.* 1845, July; *Mem. Amer. Acad. Sc. & Arts,* ii. 1846, p. 417.

Chondrostoma prolixum, *Agassiz, in Amer. Journ. Sc. & Arts,* xvii. 1854, p. 357.

—— pullum, *Agassiz, l. c.*

Campostoma anomalum, (*Rafin.*) *Agassiz, l. c.* xix. 1855, p. 218.

—— dubium, *Cope, Journ. Ac. Nat. Sc. Philad.* xiii. p. 396

? Campostoma callipteryx, *Cope, Proc. Acad. Nat. Sc. Philad.* 1864, p. 284.

D. 9. A. 8. L. lat. 49–57. L. transv. $\frac{7-9}{10}$.

The height of the body is contained four times and a half or four times in the total length (without caudal), the length of the head four times and one-third. Snout subconical, much longer than the diameter of the eye, which is from two-sevenths to one-fifth of the length of the head, and equal to, or much less than, the width of the interorbital space. No lower lip. The origin of the dorsal fin is midway between the end of the snout and the base of the caudal, a little behind the origin of the ventral; in old examples, in which the snout is more elongate, the origin of the dorsal fin is comparatively nearer to the caudal. There are from five to seven longitudinal series of scales between the lateral line and root of the ventral fin. Coloration uniform or irregularly mottled with black. Pharyngeal teeth 4—4.

United States.

a. Young. Burlington, Iowa. Presented by Th. Moore, Esq.

b. Fine specimen. Holston, Virginia. Purchased of Mr. Cope as *C. anomalum.*

c–e. Fine specimens. Miami. Purchased of Mr. Cope as *C. dubium.*

2. Campostoma ornatum.

Girard, Proc. Ac. Nat. Sc. Philad. 1856, p. 176; *U. St. & Mex. Bound. Ichthyol.* p. 41, pl. 25. figs. 1–4.

D. 10. A. 10?.

The length of the head is two-ninths of the total (without caudal). Scales much smaller than in *C. prolixum.* Sides with scattered black spots; a black patch at the base of all the fins. (*Girard.*)

Chihuahua River.

38. HYBOGNATHUS *.

Dionda, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 176.

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* 1. Hyborhynchus tenellus, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 179; or *U. S. & Pac. R. R. Exped. Fish.* p. 231.—Choctaw Agency

2. —— puniceus, *Girard, ll. cc.* pl. 52. figs. 1–5, 11–15.—Llano Estacado and Canadian River.

3. —— confertus, *Girard, ll. cc.* pl. 59. figs. 11–15.—Rio Pecos.

4. Hybognathus argyritis, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 182,

Hyborhynchus, *Girard, U. S. & Prac. R. R. Exped. Fish.* p. 230 (not *Agassiz*).

Hybognathus, *Agassiz, Amer. Journ. Sc. & Arts,* 1855, xix. p. 223.

Scales of moderate or small size; lateral line present, running along the middle of the tail. Dorsal fin short, without spinous ray, commencing nearly opposite the ventrals; anal fin short. Mouth anterior, or subanterior, narrow; intermaxillaries protractile; lower jaw with a rather sharp edge, the labial fold being developed on the side only. Barbels none. Gill-rakers short; pseudobranchiæ. The attachment of the gill-membrane to the isthmus takes place opposite to the angle of the præoperculum. Pharyngeal teeth compressed, 4—4, or 4 . 1—1 . 4. Intestinal tract with numerous convolutions.

United States.

1. Hybognathus nuchalis.

Agassiz, l. c. p. 224.

D. 11. A. 9. V. 8. L. lat. 38. L. transv. 5/6.

The height of the body is a little more than the length of the head, which is contained four times and one-third in the total (without caudal). Hind margin of the eye nearer to the end of the opercle than to that of the snout; snout scarcely longer than the eye, which is one-fourth of the length of the head. The dorsal begins slightly in advance of the ventrals, somewhat nearer to the end of the snout than to the root of the caudal. There are four longitudinal series of scales between the lateral line and root of the

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and *U. S. & Pac. R. R. Exped. Fish.* p. 235, pl. 53. figs. 5–8.—Missouri; Arkansas.

5. Hybognathus evansi, *Girard, ll. cc.*—Nebraska, Platte River.
6. Ceratichthys vigilax, *Baird & Girard, Proc. Ac. Nat. Sc. Philad.* 1853, p. 391; Leuciscus vigilax, *Baird & Girard, in Marcy, Explor. Red River,* 1853, p. 248, pl. 24. figs. 1–4; Cliola vigilax, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 192; and *U. S. & Pac. R. R. Exped. Fish.* p. 257.—Red River; Arkansas
7. Cliola velox, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 192, and *U. S. & Pac. R. R. Exped. Fish.* p. 258.—Texas.
8. —— vivax, *Girard, ll. cc.*—Texas.
9. Dionda episcopa, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 177; or *U. S. & Pac. R. R. Exped. Fish.* p. 227.—Rio Pecos.
10. —— papalis, *Girard, l. c.* 1°, p. 178; or *l. c.* 2°, p. 228.—Delaware Creek (Rio Pecos).
11. —— plumbea, *Girard, l. c.* 1°, and *l. c.* 2°, pl. 52. figs. 21–25.—Canadian River.
12. —— spadicea, *Girard, l. c.* 1°, and *l. c.* 2°, p. 229, pl. 52. figs. 26–30.—Fort Smith, Arkansas.
13. —— grisea, *Girard. l. c.* 2°, p. 230, pl. 52. figs. 6–10.—Twenty miles west of Choctaw Agency.
14. —— serena, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 177, and *U. S. & Mex. Bound. Ichthyol.* p. 42, pl. 26. figs. 9–12.—Rio Sabinal, Texas.
15. —— texensis, *Girard, ll. cc.* figs. 21–24.—Rio Nueces, Texas.
16. —— argentosa, *Girard, l.c.* 1°, p. 178, and *l.c.* 2°, p. 43, pl. 26. figs. 5–8.—Texas.
17. —— chrysitis, *Girard, ll. cc.* figs. 13–16.—Live Oak Creek, Texas.
18. —— melanops, *Girard, l. c.* 1°, and *l. c.* 2°, p. 44, pl. 26. figs. 17–20.—Buena Vista, Coahuila
19. —— couchi *Girard, ll. cc.* figs. 1–4.—New Leon.

ventrals. A dark dorsal stripe from the nape to the caudal; a greyish, diffuse, longitudinal band above the lateral line. Pharyngeal teeth 4—4.

Illinois; Iowa; Missouri.

a–b. Adult. From Dr. Parnell's Collection.
b. Young, 1½ inch long. Burlington, Iowa. Presented by Th. Moore, Esq.

2. Hybognathus regius.

Hybognathus regius, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 209.

D. 11. A. 11. L. lat. 38. L. transv. 6/?.

Body elongated, compressed, its depth being one-fifth or rather less than one-fifth of the total length (without caudal); the length of the head is one-sixth of the total. Mouth quite small. Origin of the dorsal fin a little anterior to that of the ventrals, and nearer to the tip of the snout than the base of the central rays of the caudal. There are four longitudinal series of scales between the lateral line and the root of the ventral. Coloration uniform. (*Girard.*)

Pharyngeal teeth 4—4.

Maryland, U. S.

3. Hybognathus perspicuus.

Hyborhynchus perspicuus, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 179; or *U. St. & Pac. R. R. Exped. Fish.* p. 231, pl. 52. figs. 16–20.

D. 11. A. 9.

Scales of moderate size. The height of the body equals the length of the head, which is a little less than one-fourth of the total length (without caudal). Snout not longer than the large eye, which is about one-third of the length of the head. The origin of the dorsal fin is opposite to that of the ventrals, and appears to be a little nearer to the end of the snout than to the root of the caudal fin. A black spot at the base of the caudal and on the anterior margin of the dorsal. (*Girard.*)

Arkansas River.

39. ERICYMBA.

Ericymba, *Cope, Proc. Ac. Nat. Sc. Philad.* 1865, p. 87.

Scales of moderate size; lateral line complete. Dorsal fin short, without spine, not in advance of ventrals. Anal fin short; mouth inferior: intermaxillaries protractile; barbels none; mandibulary and opercular bones with external muciferous cavities separated by septary laminæ. Pharyngeal teeth hooked 4 . 1—0 . 4.

United States.

1. Ericymba buccata.

Cope, l. c., and *Journ. Ac. Nat. Sc. Philad.* xiii. p. 361, pl. 13. fig. 4.

D. 9. A. 9. V. 8. L. lat. 33. L. transv. 5/?.

The height of the body is contained nearly five times in the total length (without caudal), the length of the head thrice and five-sixths. The diameter of the eye is a little less than one-third of the length of the head. The tail is rather elongate. Origin of the dorsal fin somewhat nearer to the end of the snout than to the root of the caudal, and opposite to the origin of the ventral. A narrow brown vertebral line from the nape to the tail; sides with a lateral band of brown punctulations. (*Cope.*)

United States.

40. PSEUDORASBORA.

Pseudorasbora, *Bleeker*, *Act. Soc. Sc. Indo-Neerl.* viii. *Japan*, vi. p. 97; or *Cypr. Prodr.* p. 435.

Scales rather large, lateral line running along the middle of the tail. Mouth very small, transverse, directed upwards; mandible with a hard trenchant edge, and a subcontinuous transverse labial fold; barbels none. Dorsal fin short, without pungent spine, opposite to the ventral; anal short; caudal forked. Gill-openings narrow, the attachment of the gill-membranes to the isthmus takes place opposite to the middle of the operculum; pseudobranchiæ; gill-rakers none Pharyngeal teeth compressed, 5—5. Intestinal tract short.

Japan.

1. Pseudorasbora parva.

Leuciscus parvus, *Schleg. Faun. Japon. Poiss.* p. 215, pl. 102. fig. 3.
—— pusillus, *Schleg. l. c.* p. 216. fig. 4.
Pseudorasbora pusilla, *Bleek. Act. Soc. Sc. Indo-Neerl* viii. *Japan*, vi. p. 98.
—— parva, *Kner, Novara, Fische*, p. 355.
Opsarius parvus, *Kner, l. c.* tab. 16. fig. 3.

D. 10. A. 8. V. 8. L. lat. 36. L transv. 5½/5.

The height of the body is equal to the length of the head, which is about one-fourth of the total (without caudal). Snout as long as the eye, the diameter of which is two-sevenths of the length of the head. The origin of the dorsal fin is opposite to that of the ventrals, and scarcely nearer to the end of the snout than to the root of the caudal fin. Pectoral fin terminating at some distance from the ventrals. There are three longitudinal series of scales between the lateral line and ventral fin. Coloration uniform.

Japan; China.

a Three inches long. Japan. From Dr. Bleeker's Collection.
b Two and a half inches long. Chikiang. Purchased of Mr. Fortune.—Fine specimen, each scale with a deep-black margin.
c. Adult, 3½ inches long. Purchased of Mr. Frank.—Snout with large, conical, pointed, hard tubercles.

41. COCHLOGNATHUS.

Cochlognathus, *Baird & Girard*, *Proc. Ac. Nat. Sc. Philad.* 1854, p. 158, and 1856, p. 181.

This genus is described thus:—

Jaws with spoon-shaped bony expansions. There is one on each side on the upper as well as on the lower jaw, exactly as in the genus *Tetraodon*, their edge being sharp and cutting. The dorsal fin has the structure of that of *Pimephales*; the insertion of the ventrals is situated under the anterior margin of the dorsal, the caudal being furcated. The scales are large, and the lateral line follows the middle of the flanks; the isthmus rather wide. The pharyngeals have the same shape and form as in *Pimephales*; the teeth, however, are more slender and concave upon the grinding-surface, giving them the appearance of being bent backwards: they are of the same type, a little more conspicuously hooked, 4—4.

Texas.

1. Cochlognathus ornatus.

Baird & Girard, l. c. 1854, p. 158, and *U. S. & Mex. Bound. Ichthyol.* p. 46, pl. 35. figs. 12–17.

D 9. A. 6.

Head forming two-ninths of the entire length, and abruptly rounded off on the snout; mouth proportionately small and terminal, with oblique cleft. Eyes rather above the medium size, their diameter being contained four times in the length of the side of the head. Body much compressed, covered with large scales disposed in twelve longitudinal rows on the line of greatest depth. Lateral line inflexed downwards upon the abdomen. Anterior margin of dorsal nearly equidistant between the snout and rudimentary rays of the caudal; anal situated entirely backwards of the dorsal; caudal forked. Insertion of ventrals beneath the anterior margin of dorsal; tip of pectoral not reaching them. The colours, as preserved in alcohol, present a reddish-brown ground, and a dark lateral band or stripe. The dorsal fin exhibits two elongated dark spots, one anterior and basal, the other posterior and nearer to its tip. The posterior half of the caudal has likewise a darker hue than its anterior and basal half, which is of a dull orange, as is also its extreme margin. (*Girard.*)

Brownsville; Texas.

42. EXOGLOSSUM.

Exoglossum, *Rafinesque, Journ. Ac. Sc. Nat. Philad.* i. p. 419; *Cuv. & Val.* xvii. p. 480; *Agassiz, Amer. Journ. Sc. & Arts*, 1855, xix. p. 215.

Scales of moderate size, lateral line present and complete. Dorsal fin short, without spinous ray, commencing above the ventrals; anal fin short. Mouth inferior, of moderate width; the upper jaw is subsemicircular in its outline, not protractile, provided with a thick lip overlapping the lower jaw. The mandibles are united by a broad symphysis extending along the entire length of the dentary bones, the symphysial portion being prominent, narrow, tongue-shaped, with a sharpish edge, destitute of a labial covering, the labial fold being developed towards the angle of the mouth only: barbels none; gill-rakers extremely feeble: pseudobranchiæ. The gill-cavity communicates with that of the mouth by a comparatively narrow opening; and also the external gill-opening is narrow, the attachment of the gill-membrane to the isthmus taking place immediately before the root of the pectoral fin. Pharyngeal teeth 4 . 1—1 . 4, hooked, not denticulated. The short upper and lower caudal rays closely attached to one another.

United States.

1. Exoglossum maxillilingua.

Cuttlips, Nigger-chub, Day-chub
Cyprinus maxillingua, *Lesueur, Journ. Ac. Nat. Sc. Philad.* i. p. 85.
Exoglossum lesurianum, *Rafinesque, l. c.* p. 420; *Cuv. & Val.* xvii. p. 482, pl. 519.
—— maxillingua, *Agass. Amer. Journ. Sc. & Arts,* 1855, xix. p. 215; *Cope, Journ. Ac. Nat. Sc. Philad.* xiii. p. 360, pl. 11. fig. 1.

D. 9. A. 8. L. lat. 55. L. transv. 9/9.

The height of the body is nearly one-fifth of the total length (without caudal), the length of the head a little less than one-fourth; snout scarcely longer than the diameter of the eye, which is contained thrice and two-thirds in the length of the head. Interorbital space flat, of moderate width. The origin of the dorsal fin is scarcely behind that of the ventral, and equidistant between the end of the snout and the root of the caudal fin. Caudal emarginate. There are five longitudinal series of scales between the lateral line and the root of the ventral. A blackish spot at the root of the caudal fin.

United States.

a–b. Adult. Kenhawa River. From Mr. Cope's Collection.

2. Exoglossum mirabile.

Girard, Proc. Ac. Nat. Sc. Philad. 1856, p. 191; *U. S. Pac. R. R. Exped. Fish.* p. 256, pl. 56. figs. 5–8.

D. 10. A. 9.

The length of the head is one-sixth of the total (with the caudal). Origin of the dorsal fin in advance of that of the ventrals, and nearer the extremity of the snout than the base of the caudal. A blackish spot on the end of the tail. (*Girard.*)

Arkansas River.

43. RHINICHTHYS[*].

Argyreus, *Heckel, in Russegger's Reisen,* i. p. 1040 (preoccupied).
Rhinichthys, *Agassiz, Lake Super.* p. 353.
Argyreus (? *and* Agosia), *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, pp. 185, 186.

Scales very small; lateral line present. Dorsal fin short, without spine, not in advance of the ventrals. Anal fin short. Mouth inferior; intermaxillaries not protractile, their upper middle margin being continuous with the skin of the upper part of the snout; the labial fold of the lower lip is lateral only, not extending across the symphysis; no barbel, or only a rudimentary one at the angle of the mouth, quite at the extremity of the maxillary. Gill-rakers very short, and few in number; pseudobranchiæ. Pharyngeal teeth uncinate, 4 . 1—2 . 4.

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[*] 1. Argyreus nubilus, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 186.—Fort Steilacoom, Puget Sound.
2. —— osculus, *Girard, l. c.*, and *U. S. & Mex. Bound. Ichth.* p. 46, pl. 27. figs. 9-12.—River Babocomori, a tributary of the Rio San Pedro.
3. —— notabilis, *Girard, ll. cc.* figs. 5--8.—Rio Santa Cruz, Sonora.—The

North America.

1. Rhinichthys nasutus.

Leuciscus nasutus, *Ayres, Bost. Journ. Nat. Hist.* iv. p. 299, pl. 13. fig. 3 (one of the best descriptions in American ichthyological literature); *Storer, Mem. Amer. Acad.* v. 1855, p. 289, pl. 22. f. 1.
Rhinichthys nasutus, *Agassiz, l. c.* (name only).
Argyreus nasutus, *Cope, Journ. Acad. Nat. Sc. Philad.* xiii. p. 369, pl. 12. fig. 5.

D. 10. A. 8. L. lat. 65. L. transv. 14/18.

Barbel minute. The eye is half as long as the snout, and occupies the middle of the length of the head. Snout projecting beyond the mouth. The height of the body is contained five times in the total length (without caudal), the length of the head thrice and four-fifths. The origin of the dorsal fin is a little nearer to the root of the caudal than to the end of the snout, and conspicuously behind the origin of the ventrals. Sides of the body with a very indistinct, dark longitudinal band.

Eastern States of North America.

a. Adult. Kenhawa River. From Mr. Cope's Collection.

2. Rhinichthys marmoratus.

Agassiz, Lake Superior, p. 354, pl. 2. figs. 1–2.

D. 10. A. 8. L. lat. 70. L. transv. 12/20.

Barbel half as long as the eye, which is small and two-fifths of the length of the snout, occupying the middle of the length of the head. Snout projecting beyond the mouth. The height of the body is contained five times and one-third in the total length (without caudal), the length of the head four times and one-fourth. The origin of the dorsal fin is nearly midway between the end of the snout and

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characters of the two latter species cannot be determined, descriptions and figures being alike unreliable.

4. Argyreus dulcis, *Girard, l. c.* p. 185; or *in U. S. Pac. R. R. Exped. Fish.* p. 243, pl. 54. fig. 5.—Sweet Water, Nebraska.

Nothing being known of the structure of the mouth of the two following fish, I am not certain whether they ought to be referred to this or to some other genus.

5. Agosia chrysogaster, *Girard, Proc. Acad. Nat. Sc. Philad.* 1856, p. 187, and *U. S. & Mex. Bound. Ichthyol.* p. 48, pl. 28. figs. 5–8.—Rio Sa Cruz, Sonora.
6. —— metallica, *Girard*, ibid., and *l. c.* p. 49, pl. 29. figs. 1–4.—Rio San Pedro, a tributary of the Gila.

the root of the caudal, and conspicuously behind the origin of the ventrals. Sides of the body irregularly marbled with brown and black.

Canada.

a–b. Fine specimens (3–4 inches long). Montreal. Presented by Th. Moore, Esq.

This fish appears to have a somewhat smaller eye than *Rh. nasutus*, of which it is, perhaps, merely a variety.

3. Rhinichthys maxillosus.

Cope, Proc. Acad. Nat. Sc. Philad. 1864, p. 278.

D. 10. A. 8. L. lat. 78. L. transv. 15/20.

Barbel nearly half as long as the eye, which is small, one-half of the extent of the snout, and situated in the anterior half of the length of the head. The height of the body is contained five times and one-third, the length of the head four times in the total length (without caudal). Snout distinctly projecting beyond the mouth. The origin of the dorsal fin is much nearer to the root of the caudal than to the end of the snout, and behind the ventral. Sides with a dark longitudinal shade; a dark spot at the base of the caudal fin.

Kansas.

a–b. Two of the typical specimens. Purchased of Mr. Salvin.

4. Rhinichthys obtusus.

Rhinichthys obtusus, *Agassiz, Amer. Journ. Sc. & Arts*, 1854, xvii. p. 357.
—— lunatus, *Cope*, *Proc. Ac. Nat. Sc. Philad.* 1864, p. 278.

D. 10. A. 8. L. lat. 63–69. L. transv. 13/18.

Barbel minute. Snout but slightly projecting beyond the mouth. The height of the body is contained four times and three-fourths in the total length (without caudal), the length of the head four times or four times and one-fourth. The eye is two-thirds of the extent of the snout, and nearer to the end of the snout than to that of the opercle. The origin of the dorsal fin is conspicuously behind that of the ventrals, and much nearer to the root of the caudal than to the end of the snout. A dark band, with lighter edges, runs from the snout to the caudal. Back mottled with brown.

Tennessee River, Holston River, Michigan.

a. Adult. Tennessee River. Presented by Th. Moore, Esq
b–e. Adult. Holston River. From Mr. Cope's Collection (*Argyreus lunatus*).

5. Rhinichthys meleagris.

Agassiz, in Amer. Journ. Sc. & Arts, 1854, xvii. p. 357.

This fish is characterized thus:—

It is remarkably short and stout in comparison to its congeneric types, also smaller. The whole body is dotted with black upon a silvery ground, the dots partly confluent; the belly only is plain silvery white.

Burlington, Iowa.

6. Rhinichthys atronasus.

Cyprinus atronasus, *Mitch. Lit. & Phil. Trans. New York*, i. p. 460.
Argyreus atronasus, *(Heckel) Storer, Mem. Amer. Acad.* v. 1855, p. 288, pl. 21. fig. 4.
Leuciscus atronasus, *Storer, Report Fish. of Massachus.* p. 92; *Cuv. & Val.* xvii. p. 376, pl. 511; *Dekay, New York Fauna, Fish.* p. 205, pl. 23. fig. 69.
Rhinichthys atronasus, *Agass. Lake Super.* p. 354 (name only).

D. 10. A. 8. L. lat. 65. L. transv. 13/16.

Barbels none. Jaws nearly even in front. The height of the body is contained four times and two-thirds in the total length (without caudal), the length of the head thrice and three-fourths. The diameter of the eye is nearly two-thirds of the extent of the snout. The origin of the dorsal fin is nearer to the root of the caudal than to the end of the snout, and somewhat behind that of the ventrals. A black band runs from the snout to the root of the caudal.

United States.

a. Adult. North America. Purchased of Hr. Brandt.
b–c. Adult. Parmachenee Lake. Purchased of Mr. Wright.

Third Group. ROHTEICHTHYINA.

Anal fin very short, with not more than six branched rays. Dorsal fin behind ventrals. Abdomen compressed. Lateral line running along the median line of the tail. Mouth without barbels. Pharyngeal teeth in a triple series.

44. ROHTEICHTHYS.

Rohteichthys, *Bleek. Prodr. Cypr.* p. 395.

Scales rather small. Belly compressed into a sharp ridge behind the ventrals, the scales of one side not overlapping on the other. Dorsal fin short, with a strong serrated ray, behind the ventral; anal fin short. Cleft of the mouth lateral; barbels none. Pharyngeal teeth compressed, terminating in a hook, 5 . 3 . 2—2 . 3 . 5.

East-Indian archipelago.

1. Rohteichthys microlepis.

Barbus microlepis, *Bleek. Nat. Tydschr. Ned. Ind.* i. p. 12.
Systomus microlepis, *Bleek. l. c.* ii. p. 60.
Rohteichthys microlepis, *Bleek. Prodr. Cypr.* p. 396; or *Atl. Ichth. Cypr.* p. 115, tab. 40. fig. 3.

D. 12. A. 8. L. lat. 70–72. L. transv. 14/15.

The osseous dorsal ray is strong, coarsely serrated. Upper profile of the head very concave. Mouth rather wide, the maxillary extending nearly to the vertical from the front margin of the orbit; the lower jaw projecting slightly beyond the upper, with a continuous fold. There are eleven longitudinal series of scales between the lateral line and the ventral fin. Coloration uniform.

Borneo and Sumatra.

a. Type of the species. From Dr. Bleeker's Collection.

Fourth Group. LEPTOBARBINA.

Anal fin very short, with not more than six branched rays. Dorsal fin opposite to ventrals. Abdomen not compressed. Lateral line running in the lower half of the tail. Barbels present, not more than four in number. Pharyngeal teeth in a triple series.

45. LEPTOBARBUS.

Leptobarbus, *Bleek. Prodr. Cypr.* p. 432.

Scales of moderate size. Lateral line curved downwards, running along the lower half of the tail. Dorsal fin with seven branched rays, inserted above the origin of the ventrals; anal short. Mouth of moderate width, not extending to the front margin of the orbit, with the jaws equal in front; barbels four, well-developed. Suborbital narrow. Gill-rakers short, lanceolate, widely set; pseudobranchiæ. Pharyngeal teeth, 5 . 3 . 2—2 . 3 . 5, crenulated, uncinate.

East-Indian archipelago.

1. Leptobarbus hoevenii.

Barbus hoevenii, *Bleek. Nat. Tydschr. Ned. Ind.* ii. p. 207.

Leptobarbus hoevenii, *Bleek. Prodr. Cypr.* p. 433; or *Atl. Ichthyol. Cypr.* p. 116, tab. 31. fig. 2.

D. 10. A. 7. L. lat. 34–35. L. transv. $4\frac{1}{2}/5$.

Two and a half longitudinal series of scales between the lateral line and ventral fin; barbels half as long as the head. Coloration uniform.

Sumatra and Borneo.

a. One of the typical specimens. From Dr. Bleeker's Collection.

Fifth Group. RASBORINA.

Anal fin very short, with not more than six branched rays. Dorsal fin inserted behind the origin of ventrals. Abdomen not compressed. Lateral line running along the lower half of the tail, if complete. Mouth sometimes with barbels, which are never more than four in number. Pharyngeal teeth in a triple or single series. Air-bladder present, without osseous covering.

46. RASBORA.

Leuciscus, sp., *Cuv. & Val.*
Rasbora, sp., *Bleek.*

Scales large, or of moderate size, there being generally four and a half longitudinal series of scales between the origin of the dorsal fin and the lateral line, and one between the lateral line and the ventral. Lateral line curved downwards, running along the lower part of the tail. Dorsal fin with seven or eight branched rays, inserted behind the origin of the ventrals, but not extending to above the anal, which is seven-rayed. Mouth of moderate width, extending to the front margin of the orbit, with the lower jaw slightly prominent and provided with three prominences in front, fitting into grooves of the upper jaw; barbels none, in one species two. Gill-rakers short, lanceolate (see *R. zanzibarensis*); pseudobranchiæ. Pharyngeal teeth in three series, uncinate.

East-Indian continent and archipelago; east coast of Africa.

The species may be divided into those:—

a. Without barbels. *Rasbora*, p. 193.
β. With barbels. *Megarasbora*, p. 198.

α. Without barbels.

1. Rasbora cephalotænia.

Leuciscus cephalotænia, *Bleek. Nat. Tydschr. Ned. Ind.* iii. p. 97.
Rasbora cephalotænia, *Bleek. Prodr. Cypr.* p. 438; or *Atl. Ichthyol. Cypr.* p. 119, pl. 17. fig. 3.

L. lat. 31–32. The origin of the dorsal fin is nearer to the base of the ventrals than to that of the anal, and opposite to the eleventh scale of the lateral line. The length of the head is one-fourth of the total (without caudal). A black band runs from the snout to the end of the middle caudal rays; it is simple on the head, split into two series of spots on the body, and simple again on the caudal; there is a darker spot on the root of the caudal: sometimes another simple dark band along the side of the belly.

Borneo; Banka; Biliton.

a. Type of the species. From Dr. Bleeker's Collection.

2. Rasbora daniconius.

Cyprinus daniconius, *Ham. Buch. Fish. Gang.* p. 327, pl. 15. fig. 89.
—— anjana, *Ham. Buch. Fish. Gang.* pp. 329, 391.
Leuciscus daniconius, *M'Clell. Ind. Cypr.* pp. 292, 405.
—— lateralis, *M'Clell. Ind. Cypr.* pp. 292, 405.
Leuciscus dandia, *Cuv. & Val.* xvii. p. 309.
—— malabaricus, *Jerdon, Madr. Journ. Lit. & Sc.* xv. 1849, p. 320.
—— einthovenii, *Bleek. Nat. Tydschr. Ned. Ind.* ii. p. 434.
Rasbora einthoveni, *Bleek. Prodr. Cypr.* p. 440; or *Atl. Ichthyol. Cypr.* p. 120, pl. 21. fig. 1.
—— dandia, *Bleek. Nat. Verhandl. Holl. Maatsch. Haarlem,* 1864. *Cypr. & Cobit. Ceylon,* p. 18, pl. 1. fig. 3.
—— malabarica, *Day, Fish. Malab.* p. 220.
—— woolaree, *Day, Proc. Zool. Soc.* 1867, p. 298.
Opsarius daniconius, *Kner, Novara, Fische,* p. 358.

L. lat. 31–32. The origin of the dorsal fin is somewhat nearer to the base of the ventrals than to that of the anal, and opposite to the twelfth or thirteenth scale of the lateral line. The height of the body is nearly equal to the length of the head, which is one-fourth, or sometimes more than one-fourth, of the total (without caudal). A straight black band runs from the snout to the end of the middle caudal rays.

Vertebræ 18/14.

East-Indian continent and archipelago.

a. Half-grown. North-west Hindostan. From the Collection of Messrs. von Schlagintweit (*C. daniconius*).
b. Adult: skin. Northern India. Presented by Lieut.-Col. Playfair.
c, d–e. Adult and half-grown. Malabar. Presented by Surgeon Day (*L. malabaricus*).
f–h. Half-grown. Nilgherries. Purchased of Surgeon Day as *R. woolaree*.
i, k, l, m–n, o–p, q–s, t–w. Adult and half-grown. Ceylon Purchased of Mr. Cuming.
x. Half-grown. Pachebon (Siam). From M. Mouhot's Collection.
y. One of the typical specimens of *R. einthovenii*. From Dr. Bleeker's Collection.
z. Adult female: skeleton. Ceylon. Presented by Dr. A. Günther.

This species has a wide geographical range, yet the variations are but very slight. M'Clelland's statement that it has forty scales in the lateral line is erroneous; on the other hand. Buchanan has represented them too large. I have convinced myself that the pharyngeal teeth are 5 . 4 . 2—2 . 4 . 5, and not in two series as stated by Valenciennes. One might be tempted to regard *R. einthovenii*, Blkr., as distinct, if the figure given of it be alone consulted. However, it appears from his description that normally the black band is not so much curved as represented; and the specimen sent to the British Museum is absolutely identical with *R. daniconius*.

3. Rasbora lateristriata.

Leuciscus lateristriatus (*v. Hass.*) *Bleek. Nat. Tydschr. Ned. Ind.* iii. p. 94.
Rasbora lateristriata, *Bleek. Prod. Cypr* p. 441; or *Atl. Ichthyol. Cypr.* p. 121, tab. 17. fig. 2.

Closely allied to *R. daniconius.*

L. lat. 30–31. The origin of the dorsal fin is nearer to the base of the ventrals than to that of the anal, and opposite to the eleventh scale of the lateral line. The length of the head is one-fourth of the total (without caudal). A narrow blackish band runs from the shoulder to a round black spot on the root of the caudal fin. A blackish spot on each side of the anterior anal rays.

Java, Sumatra, and Borneo.

a. Type of the species. From Dr. Bleeker's Collection.
b. Adult. Labuan. Presented by L. Dillwyn, Esq.

4. Rasbora kallochroma.

Leuciscus kallochroma, *Bleek. Nat. Tydschr. Ned. Ind.* i. p. 272.
Rasbora kallochroma, *Bleek. Prod. Cypr.* p. 443; or *Atl. Ichthyol. Cypr.* p. 121, tab. 20. fig. 1.

L. lat. 30. The origin of the dorsal fin is somewhat nearer to the base of the ventrals than to that of the anal, and opposite to the tenth scale of the lateral line. The length of the head is one-fourth of the total (without caudal); pectoral fin as long as the head. A blackish spot in the middle of the side of the trunk, another, very large, in the middle of the side, above the anal fin; generally some smaller spots between the larger ones, and a band from the largest to the root of the caudal fin.

Borneo and Banka.

a. Type of the species. Borneo. From Dr. Bleeker's Collection.

5. Rasbora argyrotænia.

Leuciscus argyrotænia, *Bleek. Verh. Bat. Gen.* xxiii. *Midd. Oost-Java*, p. 21.
—— cyanotænia, *Bleek. l. c.*
—— dusonensis, *Bleek. Ned. Tydschr. Dierk.* i. p. 14.
—— schwenkii, *Bleek. Act. Soc. Sc. Neerl.* iii. *Sumatra*, vi. p. 47.
Rasbora argyrotænia, *Bleek. Prodr. Cypr.* p. 448; or *Atl. Ichthyol. Cypr.* p. 123, tab. 21. fig. 3.
—— dusonensis, *Bleek. Prodr. Cypr.* p. 445; or *l. c.* p. 122, tab. 19. fig. 1.
—— borneensis, *Bleek. Prodr. Cypr.* p. 450; or *l. c.* p. 124, tab. 14. fig. 2.

L. lat. 30–32. The origin of the dorsal fin is nearly in the middle between the base of the ventrals and the anal, and opposite to the eleventh or twelfth scale of the lateral line. The length of the head is contained from thrice and one-half to four times and one-half in the total (without caudal). A silvery streak or band along the sides of the body, more distinct and better defined in young individuals than in old ones.

East-Indian archipelago.

a. Type of *R. dusonensis*. From Dr. Bleeker's Collection.
b. Type of *R. argyrotænia*. From Dr. Bleeker's Collection.
c. One of the types of *R. borneensis*. From Dr. Bleeker's Collection.

6. **Rasbora leptosoma.**

Leuciscus leptosoma, *Bleek. Nat. Tydsch. Ned. Ind.* ii. p. 269.
Rasbora leptosoma, *Bleek. Prodr. Cypr.* p. 446; or *Atl. Ichthyol. Cypr.* p. 123, tab. 43. fig. 4.

L. lat. 31. The origin of the dorsal fin is much nearer to the base of the ventrals than to the anal. The length of the head is two-ninths of the total (without caudal). A more or less distinct silvery band along the side.

Sumatra.

a. One of the typical specimens, not in good state. Lahat. From Dr. Bleeker's Collection.

7. **Rasbora buchanani.**

Cyprinus rasbora, *Ham. Buch. Fish. Gang.* pp. 329, 391, pl. 2. fig. 90.
Leuciscus rasbora, *M'Clell. Ind. Cypr.* pp. 292, 407; *Cant. Mal. Fish.* p. 268; *Bleek. Verh. Bat. Gen.* xxv. *Beng. & Hindost.* p. 140.
Rasbora buchanani, *Bleek. Prodr. Cypr.* p. 451; or *Atl. Ichthyol. Cypr.* p. 125, pl. 14. fig. 3.

L. lat. 25–26. The origin of the dorsal fin is nearer to the base of the ventrals than to the anal, and opposite to the ninth scale of the lateral line. The length of the head is a little less than one-fourth of the total (without caudal); pectoral fin as long as the head. Coloration nearly uniform, a faint silvery streak along the side.

Assam; Bengal; Pinang.

a. Adult. River Hooghly. From Dr. Bleeker's Collection.
b–c. Adult: skins. Pinang. From Dr. Cantor's Collection.
d–e. Adult. Purchased of Mr. Frank.

8. **Rasbora sumatrana.**

Leuciscus sumatranus, *Bleek. Nat. Tydschr. Ned. Ind.* iii. p. 601.
Rasbora sumatrana, *Bleek. Prodr. Cypr.* p. 453; or *Atl. Ichthyol. Cypr.* p. 126, pl. 20. fig. 3.

Scarcely distinct from *R. buchanani*.

L. lat. 25. The origin of the dorsal fin is nearer to the base of the ventrals than to the anal, and opposite to the tenth scale of the lateral line. The length of the head is contained thrice and one-half or thrice and two-thirds in the total (without caudal); pectoral fin scarcely as long as the head. Coloration uniform.

Sumatra.

a. Type of the species. Solok. From Dr. Bleeker's Collection.

Although Dr. Bleeker states that in this species the dorsal fin is in the middle between ventrals and anal, the figure given by himself contradicts this assertion. The specimen which I have for examination has the dorsal as much advanced as it is shown in that figure.

Rasbora macrocephalus, Bleeker, Atl. Ichthyol. Cypr. p. 126, tab. 2. fig. 10, is probably only a variety of *R. sumatrana* with a more elongate body. The free portion of the tail in our specimens is nearly twice as long as deep, whilst in our specimen of *R. sumatrana* it is only one-third longer than deep. However, it would appear from Bleeker's descriptions and figures that there are intermediate forms between these extremes.

a. Type of *R. macrocephalus*. Java. From Dr. Bleeker's Collection.
b. Adult. Purchased of Mr. Frank.

9. Rasbora bankanensis.

Leuciscus bankanensis, *Bleek. Nat. Tydschr. Ned. Ind.* v. p. 192.
Rasbora bankanensis, *Bleek. Prod. Cypr.* p. 454; or *Atl. Ichthyol. Cypr.* p. 127, tab. 14. fig. 3.

L. lat. 22–23. The origin of the dorsal fin is midway between the base of the ventrals and the anal. The length of the head is contained thrice and two-thirds in the total (without caudal). Outer half of the anal fin deep black.

Banka.

a. Type of the species, in bad state. Marawang. From Dr. Bleeker's Collection.

10. Rasbora nilgherriensis.

Rasbora neilgherriensis, *Day, Proc. Zool. Soc.* 1867, p. 298.

L. lat. 34. L. transv. $6\frac{1}{2}/5$.

Dorsal fin inserted immediately behind the ventrals, opposite to the thirteenth scale of the lateral line, its origin being midway between the root of the caudal and the front margin of the eye. The height of the body is rather less than one-fourth, the length of the head one-fourth of the total (without caudal). Head broad; eye rather small, its diameter being less than the length of the snout, and one-fifth of that of the head. Prominences of the lower jaw very inconspicuous. Two longitudinal series of scales between the lateral line and ventral fin. A broad brownish band along the side of the head and body.

Nilgherries.

a–b. Fine specimens. Purchased of F. Day, Esq.

11. Rasbora zanzibarensis.

Günth. Fish. Zanzibar, p. 119, pl. 17. fig. 4.

D. 9. A. 8. L. lat. 33. L. transv. $5\frac{1}{2}/4$.

Dorsal fin midway between ventrals and anal. Body compressed, oblong, its greatest depth being equal to the length of the head.

which is two-sevenths of the total (without caudal). Head rather low, with the upper profile somewhat concave. The width of the interorbital space is much more than the diameter of the eye, which equals the length of the snout, and is one-fourth of that of the head. Mouth oblique, of moderate width, the maxillary extending to the vertical from the front margin of the orbit; lower jaw projecting beyond the upper. Caudal fin deeply forked. Each series of scales along the side of the body with an obtuse ridge; two longitudinal series of scales between the lateral line and ventral fin. Coloration uniform, silvery. Gill-rakers rather slender, not very short, setiform.

River Rovuma.

a. Type of the species. From Lieut.-Col. Playfair's Collection.

β. *With barbels* (Megarasbora).

12. Rasbora elanga.

Cyprinus elanga, *Ham. Buch. Fish. Gang.* p. 281.
Leuciscus dystomus, *M'Clell. Ind. Cypr.* pp. 292, 406, pl. 56. fig. 4.

D. 9. A. 7. V. 8. L. lat. 40. L. transv. 7/5.

The height of the body equals the length of the head, which is one-fourth of the total (without caudal). Snout somewhat pointed, but scarcely longer than the diameter of the eye, which is nearly one-fourth of the length of the head, and much less than the width of the interorbital space. Jaws even in front, with the notches and prominences very conspicuous. A pair of barbels near the upper end of the maxillaries; they are very small, scarcely half as long as the eye. Origin of the dorsal fin immediately behind the root of the ventrals, and midway between the root of the caudal and the eye. Pectoral fin not extending to the ventral. There are one and a half longitudinal series of scales between the lateral line and ventral fin. Uniform silvery.

Assam and Bengal.

a. Four and a half inches long. Cachar. Presented by Lieut.-Col. Playfair

47. LUCIOSOMA.

Barbus, sp., *Cuv. & Val.*
Luciosoma, *Bleek. Prodr. Cypr.* p. 411.
Trinematichthys, *Bleek. Atl. Ichth. Cypr.* p. 131.

Scales of moderate size. Lateral line curved downwards, running along the lower part of the body and tail. Dorsal fin with seven branched rays, inserted behind the ventrals, and extending to above the anal; anal short. Mouth very wide, extending beyond the front margin of the orbit, with the lower slightly prominent and tapering into a tubercle fitting into a groove of the upper jaw. Barbels four, more or less developed. The third suborbital is broad, nearly covering the cheek entirely. Gill-rakers extremely short, widely set; pseudobranchiæ. Pharyngeal teeth 5 . 4 . 2—2 . 4 . 5, uncinate.

East-Indian archipelago.

1. Luciosoma setigerum.

Barbus setigerus, *Cuv. & Val.* xvi. p. 203, pl. 469.
—— podonemus, *Bleek. Verh. Bat. Gen.* xxiii. *Midd. Oost-Java*, p. 18.
Luciosoma setigerum, *Bleek. Nat. Tydschr. Ned. Ind.* ix. p. 264; or *Prodr. Cypr.* p. 413; or *Atl. Ichthyol. Cypr.* p. 131, tab. 41. fig. 2.

D. 9. A. 8. L. lat. 43. L. transv. 5½/4.

Barbels four, of equal strength and length, not quite half as long as the head. The outer ventral ray produced into a filament. A blackish band along the middle of the side, in young individuals sometimes composed of spots; a blackish band along each caudal lobe.

Java and Sumatra.

a. Half-grown. From Dr. Bleeker's Collection.

2. Luciosoma spilopleura.

Bleek. Nat. Tydschr. Ned. Ind. ix. p. 265; or *Prodr. Cypr.* p. 215; or *Atl. Ichthyol. Cypr.* p. 132, pl. 21. fig. 1.

D. 9. A. 8. L. lat. ca 42. L. transv. 5½/?.

Barbels four, the upper of which are much stronger and longer than the lower, and more than half as long as the head. The outer ventral ray is slightly produced. A row of rounded dark spots along the side of the body, continued into a band on the caudal fin; a dark band along each caudal lobe; dorsal and anal with a dark transverse streak.

Sumatra.

a. Type of the species, in bad state. Lahat. From Dr. Bleeker's Collection.

3. Luciosoma trinema.

Leuciscus trinema, *Bleek. Nat. Tydschr. Ned. Ind.* iii. p. 600.
Luciosoma (Trinematichthys) trinema, *Bleek. Prodr. Cypr.* p. 416; or *Atl. Ichthyol. Cypr.* p. 132, tab. 41. fig. 3.

D. 9. A. 8. L. lat. 43–45. L. transv. 5½/4.

Barbels minute, and the upper appear sometimes to be absent*. The outer ventral and anterior anal ray each produced into a filament. A series of round spots commences about the middle of the side of the trunk, the spots being confluent into a band on the tail, which is continued along the upper caudal lobe; the lower lobe with a similar band; a short series of blackish spots across the middle of the fore part of the dorsal and anal fins.

Sumatra and Borneo.

a. Type of the species. From Dr. Bleeker's Collection.
b. Fine specimen. Borneo.

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* Bleeker has overlooked the minute barbels, the lower of which, however, are distinct enough. Therefore the subgenus "Trinematichthys" may be cancelled again.

48. NURIA.

Nuria, *Cuv. & Val.* xvi. p. 238.

Scales large. Lateral line (if present) running along the lower part of the tail. Dorsal fin short, not much in advance of the anal, which is also short. Mouth obliquely directed upwards, narrow. Barbels four; the upper barbel much shorter than that at the angle of the mouth, which is long. Suborbitals broad. Gill-rakers short; pseudobranchiæ. Pharyngeal teeth 5—5, pointed, lanceolate.

East-Indian continent, with Ceylon.

1. Nuria danrica.

Cyprinus danrica, *Buch. Ham. Fish. Gang.* pp. 325, 390, tab. 16. fig. 88.
—— sutiha, *Buch. Ham. l. c.* pp. 327, 391.
—— jogia, *Buch. Ham. l. c.*
Perilampus recurvirostris, *M'Clell. Ind. Cypr.* pp. 290, 398, tab. 46. fig. 2.
—— macropterus, *M'Clell. l. c.* pp. 291, 398, tab. 46. fig. 3.
—— thermophilus, *M'Clell. l. c.* pp. 291, 399.
Nuria thermoicos, *Cuv. & Val.* xvi. p. 238, pl. 472.
—— thermophylos, *Cuv. & Val.* xvi. p. 240.
Leuciscus barbatus, *Jerdon, Madr. Journ. Lit. & Sc.* xv. p. 322.
Nuria danrica, *Bleek. Verh. Bat. Gen.* xxv. *Beng. & Hind.* p. 130.
Esomus (*Swains.*) danrica, *Bleek. Atl. Ichthyol. Cypr.* p. 32 (name only).
Esomus thermoicos, *Kner, Novara, Fisch.* p. 363*.
Esomus maderaspatensis, *Day, Proc. Zool. Soc.* 1867, p. 300.

D. 8. A. 7. L. lat. 29–31. L. transv. 5–6/3.

The barbels extend to, or nearly to, the ventral fins. The height of the body is nearly equal to the length of the head, which is two-ninths, or nearly two-ninths, of the total (without caudal). Pectoral fin rather longer than the head. Generally a blackish band along the middle of the side of the body.

This fish is subject to considerable variation in the proportions of the various parts of its body. Very remarkable is the difference in the length of the pectoral fin, which, in young examples, is twice as long as the head, or even longer, whilst older specimens have it comparatively much shorter.

East-Indian continent; Ceylon. This species lives occasionally in warm springs, as many other fishes.

a, b, c. Many half-grown and young specimens. Ganges.
d–i. Fine specimens, 4 inches long. Madras Presidency. Presented by Capt. Mitchell.
k. Adult. Ceylon. Purchased of Mr. Cuming.
l–n. Young. Madras. Collected by F. Day, Esq. (*Esomus maderaspatensis*).

Mr. Day (Proc. Zool. Soc. 1867, p. 299) distinguishes *Esomus malabaricus* as a separate species. The specimens sent by him are young, and not in a good state of preservation. The lateral line is absent. Whether this is to be regarded as a specific character in these fishes cannot be decided from young examples only

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* Kner adds to the synonymy M'Clelland's *Leuciscus margarodes*, erroneously referring pl. 46. fig. 2 to it. I cannot perceive how this mistake occurred, M'Clelland never having figured his *L. margarodes*.

a–d. Young. Madras. Purchased of Mr. Day.

2. Nuria alta.

Blyth, Journ. As. Soc. Beng. xxix. 1861, p. 162.

D. 8. A. 7. L. lat. 32. L. transv. 7 (?).

Upper filaments of great length, more than reaching to the anal fin. Pectorals reaching to the ventrals. The height of the body is one-fourth of the total length (with the caudal). Sides with a broad yellow band surmounted by a nearly obsolete black streak. A black spot above the base of the pectorals. (*Blyth.*)

Tennasserim. Four inches long.

49. APHYOCYPRIS.

Scales large; *lateral line incomplete.* Dorsal fin short, without spine, opposite to the interspace between ventral and anal fins. Anal fin with seven branched rays. Caudal forked. Snout with very thin lips; mouth oblique. Suborbitals rather broad. Barbels none. Pharyngeal teeth conical, hooked, in a double series.

China.

1. Aphyocypris chinensis.

D. 9. A. 9. V. 7. L. lat. 32. L. transv. 9.

The length of the head is contained thrice and two-thirds in the total (without caudal), the height of the body four times. Head moderately compressed, the interorbital space being rather broad. The diameter of the eye is a little more than the length of the snout, or than one-fourth of the length of the head. The origin of the dorsal fin is behind the ventrals, and midway between the root of the caudal and the occiput. Cleft of the mouth subvertical, broad, of moderate width, the maxillary scarcely extending to the front margin of the orbit. Lower jaw scarcely projecting beyond the upper. Uniform silvery.

Chikiang.

a. Twenty-two lines long. From Mr. Fortune's Collection.

50. AMBLYPHARYNGODON.

Mola, *Heckel, Fische, Syr. Addend. et Corrig.* p. 257; *Blyth, Journ. As. Soc. Beng.* xxix. 1861, p. 164.
Amblypharyngodon, *Bleeker, Prodr. Cypr.* p. 409.
Brachygramma, *Day, Proc. Zool. Soc.* 1865, p. 304.

Scales small; *lateral line incomplete.* Dorsal fin without an osseous ray, with not more than nine branched rays, commencing a little behind the origin of the ventrals; anal fin short. Head of moderate size, strongly compressed; eye without adipose membrane.

Snout with the integuments very thin; there is no upper lip, and the lower jaw has a short labial fold on the sides only. Mouth anterior, somewhat directed upwards, with the lower jaw prominent. Barbels none. Gill-rakers extremely short; pseudobranchiæ. Pharyngeal teeth molar-like, with their crowns concave, 3 . 2 . 1—1 . 2 . 3. Intestinal tract narrow, with numerous convolutions.

East-Indian continent.

1. Amblypharyngodon mola.

Cyprinus mola, *Ham. Buch. Fish. Gang.* pp. 334, 392, tab. 38. fig. 92.
Leuciscus mola, *M'Clell. Ind. Cypr.* pp. 293, 407; *Bleek. Verh. Bat. Gen.* xxv. *Beng. & Hindost.* p. 140.
? Rhodeus macrocephalus, *Jerdon, Madr. Journ. Lit. & Sc.* xv. 1849, p. 324.
Amblypharyngodon mola, *Bleek. Prodr. Cypr.* p. 409.

D. 10. A. 7. L. lat. 65. L. transv. 26–28.

The height of the body is one-third, or rather less than one-third, of the total length (without caudal), the length of the head two-sevenths. The origin of the dorsal fin is in the vertical from the base of the inner ventral ray. A silvery band along the middle of the side.

Bengal and Assam.

a–b. Adult. Ganges. Presented by G. R. Waterhouse, Esq.
c. Half-grown. River Hooghly. From Dr. Bleeker's Collection.
d, e, f–g, h–i. Adult and half-grown. Bengal.
k–l. Half-grown. Cachar. Presented by Lieut.-Col. Playfair.

2. Amblypharyngodon pellucidus.

Leuciscus pellucidus, *M'Clell. Ind. Cypr.* p. 293.
—— microlepis, *Bleek. Verh. Bat. Gen.* xxv. *Beng. & Hind.* p. 141.
Amblypharyngodon microlepis, *Bleek. Prodr. Cypr.* p. 409.
Mola atkinsonii, *Blyth, Journ. As. Soc. Beng.* xxix. 1861, p. 164.

D. 10. A. 7. L. lat. 55. L. transv. ca 24.

The height of the body is contained four times in the total length (without caudal), the length of the head thrice and one-third. The origin of the dorsal fin is in the vertical from the base of the inner ventral ray. A silvery band along the middle of the side.

Bengal, Assam, and Tennasserim.

a. One of the typical specimens of *L. microlepis*. River Hooghly. From Dr. Bleeker's Collection.

3. Amblypharyngodon melettinus.

Leuciscus melettinus, *Cuv. & Val.* xvii. p. 304, pl. 501 (lateral line incorrect).
Rhodeus indicus, *Jerdon, Madr. Journ. Lit. & Sc.* xv. 1849, p. 324.
Brachygramma jerdonii, *Day, Proc. Zool. Soc.* 1865, p. 304.
Amblypharyngodon jerdonii, *Day, Fish. Malabar*, p. 217, pl. 17. fig. 1 (coloration not good).

D. 10. A. 7. L. lat. 50–57. L. transv. 10/9.

The height of the body is two-sevenths or one-fourth of the total length (without caudal), the length of the head one-fourth. The origin of the dorsal fin is distinctly behind the root of the ventrals. From four to six longitudinal series of scales between lateral line and ventrals. A silvery band along the middle of the side, more distinct in young than in adult individuals.

Bombay; Coast of Malabar; Ceylon.

a, b–c. Adult and half-grown. Cochin. From the Collections of Dr. Bleeker and Surgeon Day.—Typical specimens of *B. jerdonii*.—L. lat. 50.

d. Adult: stuffed. Cochin. Presented by Surgeon Day.—L. lat. 57.

e–f. Adult and half-grown. Nilgherries. Purchased of Surgeon Day.

g–l. Adult. Madras. Presented by Capt. Mitchell.

m. Adult. Ceylon. Purchased of Mr. Cuming.—L. lat. 55.

Sixth Group. SEMIPLOTINA.

Anal fin short, with seven branched rays, not extending forwards to below the dorsal. Dorsal fin elongate, with an osseous ray. Lateral line running along the middle of the tail. Mouth sometimes with barbels. (Pharyngeal teeth in a triple series in *Cyprinion*.)

51. CYPRINION.

Cyprinion, *Heckel, in Russegger's Reisen*, i. p. 1015.

Scales of moderate size, lateral line running along the middle of the tail. Dorsal fin with a strong serrated osseous ray, and numerous branched rays. Anal fin short. Snout thick, rather prominent; mouth inferior; lower jaw with a sharp, horny edge, without lip. Barbels two. Pharyngeal teeth 4 . 3 . 2—2 . 3 . 4, compressed.

Syria, Persia.

1. Cyprinion macrostomus.

Cyprinion macrostomus, *Heckel, in Russegger's Reisen*, i. p. 1065, taf. 7. fig. 1.

—— neglectus, *Heckel, l. c.* ii. 3. p. 223, taf. 16. fig. 1.

D. 4/14. A. 9. V. 8. L. lat. 42. L. transv. 8/?.

The height of the body is one-third or two-sevenths of the total length (without caudal). The origin of the dorsal fin is somewhat in advance of the root of the ventrals; osseous dorsal ray of moderate strength and length. There are three longitudinal series of scales between the lateral line and the root of the ventral. Coloration uniform.

River Tigris; Aleppo.

2. Cyprinion kais.

Cyprinion kais, *Heckel, in Russegger's Reisen*, i. p. 1066, taf. 7. fig. 2.
—— cypris, *Heckel, l. c.* p. 1067, taf. 7. fig. 3.

D. 4/13–14. A. 8–9. V. 8. L. lat. 42. L. transv. $\frac{7-8}{?}$.

The height of the body is one-third or somewhat less than one-third of the total length (without caudal). The origin of the dorsal fin is opposite to that of the ventrals; osseous dorsal ray of moderate strength and length. There are three longitudinal series of scales between the lateral line and the root of the ventral. Coloration uniform.

River Tigris; Aleppo.

3. Cyprinion tenuiradius.

Heckel, l. c. ii. 3. p. 261.

D. 4/13. A. 9. V. 8. L. lat. 35–36. L. transv. 8/?.

The height of the body is one-fifth of the total length (with the caudal). Osseous dorsal ray slender. There are three longitudinal series of scales between the lateral line and the root of the ventral. Coloration uniform. (*Heck.*)

Rivers Araxes and Kara-Agatsch

52. SEMIPLOTUS.

Semiplotus, *Bleek. Atl. Ichthyol. Cypr.* p. 25.

Scales large, lateral line running along the middle of the tail. Dorsal fin with a strong smooth osseous ray and numerous branched rays; anal fin with more than five branched rays. Snout thick, rather prominent; "the intermaxillary is fixed to the maxillary bones, and these last to the nasal and suborbital plates, so as to admit of no independent motion in the upper jaw." Margin of the lower jaw thickened, without free lip. Mouth large, semicircular, inferior. Barbels none. Pharyngeal teeth?

Assam.

1. Semiplotus m'clellandii.

The Sundaree or Sentoree of the Assamese.
Cyprinus semiplotus, *M'Clell. Ind. Cypr.* pp. 274, 346, pl. 37. fig. 2.
Semiplotus m'clellandii, *Bleeker, l. c.* (name only).

D. 27–28. A. 9. L. lat. 30. L. transv. 6/5.

A series of pores across the snout. The osseous dorsal ray is smooth, strong, its stiff portion being three-fourths of the length of the head, which is two-ninths or one-fifth of the total (without caudal). Coloration uniform.

Assam.

a. Skin in bad state. Presented by T. C. Jerdon, Esq.

Seventh Group. XENOCYPRIDINA.

Anal fin rather short, with seven or more branched rays, not extending forwards to below the dorsal. Dorsal fin short, with an osseous ray. Lateral line running along the middle of the tail. Mouth sometimes with barbels. Pharyngeal teeth in a triple or double series.

53. XENOCYPRIS.

Scales of moderate size; lateral line running along the middle of the tail. Dorsal fin short, with an osseous and smooth spine, inserted in advance of the ventral fin. Anal fin of moderate length. Mouth small, transverse, inferior, with the margin of the lower jaw rather sharp but soft. Barbels none. Gill-rakers short, pointed; gill-opening of moderate width, the attachment of the gill-membrane taking place opposite to the angle of the præoperculum. Pharyngeal teeth compressed, 6 . 4 or 3 . 2—2 . 3 . 6.

China ?

1. Xenocypris argentea.

D. 10. A. 13. V. 9. L. lat. 54. L. transv. ca 17.

The height of the body is contained five times in the total length (without caudal), the length of the head four times and one-third; the diameter of the eye is rather more than the length of the snout, and somewhat less than one-third of that of the head. Snout obtuse, convex, slightly overlapping the mouth; the maxillary does not extend to below the front margin of the orbit. Suborbital ring very narrow. The origin of the dorsal fin is midway between the end of the snout and the root of the caudal; its spine is strong, but shorter than the head. Caudal fin forked. The pectoral fin terminates at a considerable distance from the ventral. Uniform silvery.

The pharyngeal teeth of the two inner series are exceedingly slender.

? China.

a. Four inches long: not in good state. From the Haslar Collection.

Dr. Bleeker has indicated a fish from China which may be identical, or at least congeneric, with the above species. Although the specimen was in too bad a condition to give a description of it, Dr. Bleeker named it *Acanthobrama simoni,* Nederl. Tydschr. Dierk. 1864, p. 25. He says that the pharyngeal teeth are in a single series; but then, those of the inner rows are so slender in our specimen that they may be easily overlooked or lost.

54. PARACANTHOBRAMA.

Paracanthobrama, *Bleek. Nederl. Tydschr. Dierk.* 1864, p. 23.

Scales of moderate size; lateral line straight. Dorsal fin short, with an osseous and smooth spine, opposite to the ventrals. Anal fin of moderate length. Mouth small, subinferior, subhorizontal; lips thin. A pair of maxillary barbels. Pharyngeal teeth hooked, 5 . 4—4 . 5.

China.

1. **Paracanthobrama guichenoti.**

Bleeker, l. c. p. 24.

D. 10. A. 9. V. 8. L. lat. 46–48. L. transv. $\frac{6-7}{?}$.

The height of the body is about one-fourth of the total length (without caudal), the length of the head two-ninths; the diameter of the eye equals the length of the snout, and is contained thrice and three-fourths in that of the head. Barbels scarcely shorter than the eye. Origin of the dorsal fin nearer to the root of the caudal than to the end of the snout; its spine is longer than the head. (*Blkr*).

China.

This fish may prove to be identical with *Leuciscus xanthurus*, Richards. Ichth. Chin. p. 298, named from a rather coarse drawing in the British Museum.

55. MYSTACOLEUCUS.

Systomus, sp., *Bleeker*.

Scales of moderate size; lateral line running along the middle of the tail. Dorsal fin short, with an osseous, serrated spine, inserted opposite to the ventral. Anal fin of moderate length. Mouth anterior, with the margin of the lower jaw obtuse. Barbels two. Gill-rakers short, conical; the gill-opening extends to below the angle of the præoperculum. Pharyngeal teeth obtusely uncinate, 4 . 3 . 2—2 . 3 . 4.

Sumatra.

Although the type of this genus agrees in other essential points with *Barbus*, it differs from it in a very remarkable manner in the development of the anal fin; it may be regarded as an intermediate form between *Cyprinina* and *Xenocypridina*.

1. **Mystacoleucus padangensis.**

Systomus
Puntius } (Capoeta) padangensis, *Bleek. Nat. Tydschr. Nederl. Ind.* iii. p. 593; or *Prodr. Cypr.* p. 353; or *Atl. Ichthyol. Cypr.* p. 107, tab. 34. fig. 1.

D. 12. A. 11. L. lat. 38–39. L. transv. 7/5.

The osseous dorsal ray is of moderate strength and serrated. Mouth rather narrow. The height of the body is contained thrice and one-third in the total length (without caudal), the length of the head four times. There are three longitudinal series of scales between the lateral line and the root of the ventral fin. Coloration uniform.

West coast of Sumatra.

a, b. Typical specimens. From Dr. Bleeker's Collection.

Eighth Group. LEUCISCINA.

Anal fin short or of moderate length, with from (seven) eight to eleven branched rays, not extending forwards to below the dorsal. Dorsal fin short, without osseous ray. Lateral line, if complete, running along, or nearly in, the middle of the tail. Mouth generally without barbels. Pharyngeal teeth in a single or double series.

56. LEUCISCUS.

Generic names employed for Old-World species.

Leuciscus, sp., *Klein*, *Cuvier*, *Cuv. & Val.*
Leuciscus *et* Phoxinus, *Agassiz.*
Leuciscus, Scardinius, Squalius *et* Telestes, *Bonaparte.*
Idus, Scardinius, Leucos, Leuciscus, Squalius, Telestes, Phoxinus *et* Phoxinellus, *Heckel.*
Pseudophoxinus &c., *Bleeker.*

Generic names employed for New-World species.

Hypsolepis, (*Baird*) *Storer*, *Mem. Am. Acad.* v. 1855, p. 284.
Hybopsis, *Agassiz*, *Sillim. Journ.* 1854, xvii. p. 358.
Ptychocheilus, *Agassiz*, *l. c.* 1855, xix. p. 227.
Alburnus, sp., *Agassiz.*
Alburnops, Codoma, Plargyrus, Cyprinella, Moniana, Gila, Tigoma, Cheonda, Siboma, Ptychocheilus, Hudsonius, Hybopsis, Clinostomus, Algoma, Algansea, Lavinia, *Girard*, *Proc. Ac. Nat. Sc. Philad.* 1856 pp. 180–212.
Photogenis, Alburnellus, Phoxinus, Chrosomus, &c., *Cope*, *Journ. Ac. Nat. Sc. Philad.* xiii.

Body covered with imbricate scales; lateral line generally complete, running in, or only a little below, the median line of the tail. Dorsal fin short, without stiff ray, commencing opposite, rarely behind, the ventrals. Anal fin rather short or moderately developed, generally with from nine to eleven rays, rarely with eight (in small species only), and still more rarely with fourteen rays. Mouth without structural peculiarities; lower jaw not trenchant; barbels none. Pseudobranchiæ. Pharyngeal teeth conical or compressed, in a single or double series. Intestinal tract short, with only a few convolutions.

Palæ- and Nearctic regions.

The characters used for the distinction of subgeneric groups are of so subordinate a value that no one would think of founding a genus on them, but for the circumstance that it is desirable to arrange the numerous species in a conspicuous manner. However, as this can be done in a more simple way than by overburdening the system with a number of names, which generally tend rather to disturb the unity of the system than to indicate natural affinities, I consider it best to drop them. A proceeding by which the Dace, Chub, and Roach are referred to distinct genera, cannot be to the advantage of science. In the following synopsis of species I retain the New-World species in a separate category. This is an imperfection which I am unable to avoid, in consequence of our present incomplete knowledge of this fauna. The natural history of North American freshwater-fishes is in its infancy, and only a small proportion of the literature pertaining to it has been critically examined; and this is a task which cannot be successfully undertaken without a very extensive series of examples from the various systems of rivers.

Synopsis of the Species.

I. Old-World species. (For doubtful species see note *, p. 209.)
  A. Pharyngeal teeth in a single series.
    1. Anal fin with at least ten rays; dorsal fin opposite to the ventrals (*Leuciscus*), p. 212.
    2. Anal fin with nine rays; dorsal fin inserted behind the ventrals (*Pseudophoxinus*), p. 220.
  B. Pharyngeal teeth in a double series.
    1. Lateral line complete (*Squalius, Idus, Scardinius, Telestes*), p. 220.
    2. Lateral line incomplete: *Phoxinus*, p. 237.

II. New-World species. (For doubtful species see note †, p. 209.)
  A. More than fifty scales in the lateral line.
    1. The dorsal fin commences above, or but slightly in advance of, the root of the ventrals.
      a. Pharyngeal teeth in two series, p. 239.
      b. Pharyngeal teeth in a single series (*Algansea*), p. 244.
    2. The dorsal fin commences behind the root of the ventrals, rudimental caudal rays not unusually developed.
      a. Pharyngeal teeth in two series.
        aa. Lateral line complete; pharyngeal teeth 5 or 4 . 2—2 . 4 or 5 (*Clinostomus*) p. 245.
        bb. Lateral line complete; pharyngeal teeth 3 . 1—1 . 3 [?] (*Tiaroga*), p. 247.
        cc Lateral line incomplete (*Phoxinus*, sp.), p. 247.
      b. Pharyngeal teeth in a single series (*Pseudophoxinus*, sp.), p. 247.
    3. The dorsal fin commences behind the root of the ventrals. Rudimental caudal rays much developed. Pharyngeal teeth in a single series (*Lavinia*), p. 248.
  B. Fifty or less scales in the lateral line.
    1. Pharyngeal teeth in two series.
      a. Origin of the dorsal fin opposite to the ventrals, p. 249.
      b. Origin of the dorsal fin distinctly behind the ventrals, p. 254.
    2. Pharyngeal teeth in a single series (*Moniana*), p. 258.

* 1. Leuciscus peloponensis, *Cuv. & Val.* xvii. p. 197.—Morea.
2. Cyprinus lacustris, *Pall. Zoogr. Ross.-As.* iii. p. 314.—Russia and Siberia.
3. —— brutius, *Costa, Faun. Nap. Pesc.* p. 22, tab. 18.—River Crati, near Cosenza.
4. —— dobula, var., *Costa, l. c.* p. 25, taf. 19 bis; Leuciscus sardella, *C. & V.* xvii. p. 243.—Lago di Astroni.
5. Squalius latus, *Keyserling, Zeitschr. ges. Ntrwiss.* xvii. p. 24, taf. 9.—River Heri Rud, near Herat.

† The following long list of species or specific names relates chiefly to specimens in the Smithsonian Institution, the subjects of the ichthyological portions of the Reports of the United States Expeditions. Reexamination of those specimens and a thorough revision of their descriptions are requisite to render them available to science. Duplicates have been applied for to that end, especially with reference to aims of the present work, but, up to the present, have not been received:—

α. *Specimens referred to* Leuciscus.

1. Leuciscus vittatus, *Dekay, New York Faun. Fish.* p. 212, pl. 34. fig. 108.—River Mohawk.
2. —— croceus, *Storer, Proc. Bost. Soc. Nat. Hist.* July 1845; *Mem. Amer. Acad.* ii. p. 417.—Alabama (3½ inches)
3. —— spirlingulus, *Cuv. & Val.* xvii. p. 321, pl. 506.—New Jersey, New Harmony.
4. —— rotengulus, *Cuv. & Val.* xvii. p. 318.—North America.

β. *Specimens referred to* Algoma.

5. Algoma amara, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 181; or *U. S. & Mex. Bound. Ichthyol.* p. 45, pl. 27. figs. 17–20.—Fort Brown, Texas.
6. —— fluviatilis, *Girard, ll. cc.* figs. 13–16.—Monterey, New Leon.

γ. *Specimens referred to* Alburnops.

7. Alburnops blennius, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 194; and *U. S. & Pac. R. R. Exp. Fish.* p. 261, pl. 57. figs. 13–16.—Arkansas River.
8. —— shumardi, *Girard, ll. cc.* figs. 1–4.—Arkansas River.
9. —— illecebrosus, *Girard, ll. cc.* p. 262, pl. 57. figs. 5–8.—Arkansas River.

δ. *Specimens referred to* Moniana.

10. Moniana leonina, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 199; *U. S. & Pac. R. R. Exped. Fish.* p. 273, pl. 59. figs. 6–10.—Leon River, Texas.
11. —— deliciosa, *Girard, ll. cc.* (p. 274).—Leon River, Texas.
12. —— lætabilis, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 200; *U. S. & Pac. R. R. Exped. Fish.* p. 275.—Rio Pecos.
13. —— pulchella, *Girard, ll. cc.* pl. 58. figs. 11–15.—Arkansas River.
14. —— frigida, *Girard, ll. cc.* (p. 276, pl. 59. figs. 16–20); *U. S. & Mex. Bound. Ichthyol.* p. 56, pl. 30. figs. 17–20[1].—Rio Frio, Texas.
15. Moniana aurata, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 200; *U. S. & Mex. Bound. Ichthyol.* p. 56, pl. 30. figs. 13–16.—Piedra Painte, New Mexico.
16. —— complanata, *Girard, ll. cc.* pl. 31. figs. 17–20.—Brownsville, Texas.
17 —— tristis, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 201; *U. S. & Pac. R. R. Exped. Fish.* p. 277.—Hab. —?
18. —— couchi, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 201; *U. S. & Mex. Bound. Ichthyol.* p. 57, pl. 30. figs. 21–24.—New Leon, Mexico.

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[1] Those who may be surprised at the summary way in which we deal with these species described by M. Girard, are requested to compare the descriptions and figures given of this species.

19. Moniana rutila, *Girard, ll. cc.* pl. 30. figs. 1–4.—New Leon, Mexico.
20. —— nitida, *Girard, ll. cc.* (p. 58).—New Leon, Mexico.
21. —— formosa, *Girard, ll. cc.* pl. 30. figs. 5–8.—Rio Mimbres, Mexico.
22. —— gracilis, *Girard, ll. cc.* (p. 59).—New Leon.
23. —— gibbosa, *Girard, ll. cc.* pl. 30. figs. 9–12.—Brownsville, Texas.
24. —— proserpina, *Girard, ll. cc.*—Devil's River, Texas.

ε. *Specimens referred to* Codoma.

25. Codoma ornata, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 195; or *U. S. & Mexican Boundary, Ichthyol.* p. 53, pl. 29. figs. 22–25.—Chihuahua River.
26. —— vittata, *Girard, ll. cc.* figs. 18–21.—Valley of Mexico.

ζ. *Specimens referred to* Cyprinella.

27. Cyprinella gunnisoni, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 197; *U. S. & Pac. R. R. Exp. Fish.* p. 267.—Cottonwood Creek, Utah.
28. —— beckwithi, *Girard, ll. cc.*—Arkansas River.
29. —— suavis, *Girard, ll. cc.* (p. 268).—San Antonio, Texas.
30. —— lepida, *Girard, ll. cc.* (pl. 58. figs. 21–25).—Rio Frio, Texas.
31. —— notata, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 198; *U. S. & Pac. R. R. Exped. Fish.* p. 269, pl. 58. figs. 16–20.—Rio Seco, Texas.
32. —— whipplii, *Girard, ll. cc.* (p. 270, pl. 58. figs. 6–10).—Sugarloaf Creek, Arkansas.
33. —— lugubris, *Girard, ll. cc.* (p. 271).—Cottonwood Creek, Utah.
34. —— ludibunda, *Girard, ll. cc.*—Cottonwood Creek, Utah.
35. —— macrostoma, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 198; and *U. S. & Mex. Bound. Ichthyol.* p. 54, pl. 31. figs. 5–8.—Texas and New Leon.
36. —— venusta, *Girard, ll. cc.* (figs. 1–4).—Rio Sabinal, Texas.
37. —— texana, *Gerard, ll. cc.* (p. 55, pl. 31. figs. 9–12).—Texas.
38. —— luxiloides, *Girard, ll. cc.* (figs. 13–16).—San Pedro Creek, Texas.
39. Leuciscus bubalinus, *Baird & Girard, Proc. Ac. Nat. Sc. Philad.* 1853, p. 391; and in *Marcy, Explor. Red River*, p. 249, *Zool.* pl. 14. figs. 5–8; Cyprinella bubalina, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 197; or *U. S. & Pac. R. R. Exp. Fish.* p. 266.—Otter Creek, Arkansas.
40. Cyprinella umbrosa, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 197; or *U. S. & Pac. R. R. Exped. Fish.* p. 266, pl. 58. figs. 1–5.—Coal Creek, Arkansas.

η. *Specimens referred to* Plargyrus (*Girard*) *or* Hypsolepis (*Baird*).

41. Plargyrus argentatus, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 212.—James River, Virginia.
42. Leuciscus plargyrus, (*Rafin.*) *Kirtland, Bost. Journ. Nat. Hist.* v. p. 26. pl. 8. fig. 2; Plargyrus typicus, *Girard, l. c.*—Ohio.
43. ——gibbosus, *Storer, Proc. Bost. Soc. Nat. Hist.* 1845, July; or *Mem. Amer. Acad.* ii. p. 418; Plargyrus gibbosus, *Girard, l. c.*—Alabama.

θ. *Specimens referred* to Algansea.

44. Algansea antica, *Cope, Proc. Ac. Nat. Soc. Philad*, 1864, p. 282.—Texas.

ι. *Specimens referred to* Lavinia.

45. Lavinia gibbosa, *Ayres, Proc. Calif. Acad. Nat. Sc.* 1854, p. 20.—California.—L. lat. 57.

κ. *Specimens referred to* Gila.

46. Gila affinis, *Abbott, Proc. Ac. Nat. Sc. Philad.* 1860, p. 474.—Kansas.

λ. *Specimens referred to* Tigoma.

47. Lavinia conformis, *Baird & Girard, Proc. Ac. Nat. Sc. Philad.* 1854, p. 137; Tigoma conformis, *Girard. U. S. & Pac. R. R. Exped. Fish.* p. 289.—Tulare Valley, California.

48. Tigoma bicolor, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 206; and *l. c.* p. 289.—Klamath Lake, Oregon.
49. —— obesa, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 206; and *l. c.* p. 290. —Salt Lake Valley, Utah.
50. —— humboldti, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 206; and *l. c.* p. 291.—Humboldt River.
51. —— egregia, *Girard, U. S. & Pacific R. R. Expedition, Fish.* p. 291.—Hab. —?
52. —— lineata, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 206; or *U. S. & Pac. R. R. Exped. Fish.* p. 292.—Hab. — ?
53. —— gracilis, *Girard, ll. cc.* (p. 293).—Hab. — ?
54. —— crassa, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 207; and *U. S. & Pac. R. R. Exped. Fish.* p. 293, pl. 62.—Sacramento River.
55. Gila pulchella, *Baird & Girard, Proc. Ac. Nat. Sc. Philad.* 1854, p. 29; Tigoma pulchella, *Girard, U. S. & Mex. Bound. Ichthyol.* p. 62, pl. 34. figs. 5–8.—Rio Mimbres, Mexico.
56. Tigoma purpurea, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 206; or *U. S. & Mex. Bound. Ichthyol.* p. 63.—San Bernardino.
57. —— intermedia, *Girard, ll. cc.*—Rio San Pedro.
58. Gila gibbosa, *Baird & Girard, Proc. Ac. Nat. Sc. Philad.* 1854, p. 28; Tigoma gibbosa, *Girard, U. S. & Mex. Bound. Ichthyol.* p. 64, pl. 33. figs. 1–4.—Mexico, Sonora.
59. Tigoma nigrescens, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 207; or *U. S. & Mex. Bound. Ichthyol.* p. 65, pl. 32. figs. 1–4.—Boca Grande and Janos River.
60. —— pulchra, *Girard, ll. cc.* pl. 32. figs. 5–8.—Chihuahua River.
61. —— squamata, *Gill, Proc. Bost. Soc. Nat. Hist.* 1861, viii. p. 42.—Salt Lake Basin.
62. Cheonda cærulea, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 207; or *U. S. & Pac. R. R. Exped. Ichthyol.* p. 295; *Gill, Proc. Ac. Nat. Sc. Philad.* 1865, p. 70.—Lost River, Oregon.

μ. *Specimens referred to* Hybopsis.

63. Hybognathus stramineus, *Cope, Proc. Ac. Nat. Sc. Philad.* 1864, p. 283; Hybopsis stramineus, *Cope, Trans. Am. Phil. Soc.* xiii. p. 381.—Grosse Isle, Detroit River.
64. Hybopsis gracilis, *Agassiz, in Silliman's Journ.* 1854, xvii. p. 358.—Huntsville.
65. —— winchelli, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 211.—Black Warrior River, Alabama.
66. —— fretensis, *Cope, Trans. Am. Phil. Soc.* xiii. p. 382.—Detroit, Michigan.
67. —— chalybæus, *Cope, l. c.* p. 383.—Schuylkill River, Pennsylvania.
68. Alburnops plumbeolus, *Cope, Proc. Ac. Nat. Sc. Philad.* 1864, p. 282; Hybopsis plumbeolus, *Cope, Trans. Am. Phil. Soc.* xiii. p. 382.—Pennsylvania.—A. 10. L. lat. 39.
69. Hybopsis bifrenatus, *Cope, Trans. Am. Phil. Soc.* xiii. pp. 382–384.—River Schuylkill, Pennsylvania.

ν. *Specimens referred to* Photogenis.

70. Photogenis ariommus, *Cope, Trans. Am. Phil. Soc.* xiii. p. 378.—United States.

ξ. *Specimens referred to* Alburnellus.

71. Alburnellus arge, *Cope, Trans. Am. Phil. Soc.* xiii. p. 388.—Michigan.

NAMES GIVEN TO CHINESE DRAWINGS.

Valenciennes has named a number of more or less incorrect Chinese drawings, the identification of which is a matter of great uncertainty; and although we mention those names for completeness' sake, they had, perhaps, better be omitted from systematic lists: *Leuciscus coreensis, C. & V.* xvii. p. 355; *L. rosetta* and *L. fintella*, p. 356; *L. cheranella*, p. 358; *L. jesella*, p. 360; *L. cupreus* and *L. æneus*, p. 361; and *L. randelta*, p. 363.

Richardson (Ichthyol. Chin.) has unfortunately made additions to this list; and we shall see in one instance, where he describes the bearded *Squaliobarbus curriculus* as a *Leuciscus*, that this practice is more usually accompanied by the disadvantage of misleading the author and his successors than by a gain for science. Richardson describes a *Leuciscus piceus*, *l. c.* p. 298, *L. plenus*, p. 299, and *L. homospilotus*, p. 300.

Finally, Basilewsky (*Nouv. Mém. Soc. Nat. Mosc.* x. 1855, p. 233, tab. 6. fig. 1) describes and figures a fish which appears to be a true *Leuciscus*—*Leuciscus æthiops* from Pekin.

I. *Old-World species.*

A. *Pharyngeal teeth in a single series.*

1. *Anal fin with at least ten rays; dorsal fin opposite to the ventrals* (Leuciscus).

1. **Leuciscus rutilus.**

The Roach. Das Rothauge or Die Plötze. Le Gardon. Mört (Swed.).

Lascha, *Bellon. l. c.* p. 316.

Leuciscus, *Rondel. De Pisc. Fluv.* p. 191.

Rutilus, *Gesner, De Aquat.* p. 821.

Rubellus, *Marsil. Danub. Pan.-Mys.* tab. 13. fig. 4.

Cyprinus, sp., *Artedi, Gen.* p. 3. no. 1; *Synon.* p. 10. no. 18; *Spec.* p. 10. no. 3; *Gronov. Zoophyl.* no. 340.

Cyprinus rutilus, *L. Syst. Nat.* i. p. 529; *Bl. Fische Deutschl.* i. p. 32 taf. 2; *Bl. Schn.* p. 435; *Lacép.* v. p. 575; *Pall. Zoogr. Ross.-As.* p. 317; *Donovan, Brit. Fish.* iii. pl. 67; *Turton, Brit. Faun.* p. 108; *Jenyns, Manual*, p. 408; *Yarrell, Brit. Fish.* i. p. 348; 2nd ed. i. p. 399; 3rd ed. i. p. 433; *Ekström, Fische v. Mörkö*, p. 12; *Gronov. Syst.* ed. *Gray*, p. 183.

The Roach, *Pennant, Brit. Zool.* iii. p. 319, or, ed. 1812, iii. p. 482: *Couch, Fish. Brit. Isl.* iv. p. 47, pl. 191.

Gardon, *Duham. Pêches*, ii. p. 498, tab. 24. fig. 1.

Cyprinus rubellio, *Leske, Ichthyol. Lips.* p. 53.

Leuciscus rutilus, *Fleming, Brit. An.* p. 188; *Agassiz, Mém. Soc. Sc. Nat. Neuchat.* i. p. 38; *Nordm. in Demid. Voy. Russ. Mérid.* iii. p. 489; *Parnell, Wern. Mem.* vii. p. 266; *Sélys-Longch. Faun. Belge*, p. 212, pl. 7. fig. 1; *Cuv. & Val.* xvii. p. 130; *Kröyer, Danm. Fisk.* iii. 1. p. 435; *Fries och Ekstr. Skand. Fisk.* p. 72. tab. 15; *Nilss. Skand. Faun.* iv. p. 316; *Günth. Fische d. Neckars*, p. 74; *Rapp, Fische d. Bodensee's*, p. 8; *Heckel & Kner, Süsswasserf.* p. 169. fig. 91; *Jeitteles, Fische d. March*, ii. 1864, p. 12; and *Verhandl. zool.-bot. Ges. Wien*, 1862, p. 304; *Dybowski, Cypr. Livlands*, p. 96; *Siebold, Süsswasserf.* p. 184; *Malmgren, Wiegm. Arch.* xxx. p. 318; *Jäckel, Abh. zool.-min. Ver. Regensb.* 1864, p. 68; *Blanchard, Poiss. France*, p. 382.

Leuciscus prasinus, *Agassiz, l. c.*; *Cuv. & Val.* xvii. p. 198.

—— decipiens, *Agassiz, l. c.*

—— selysii, (*Heckel*) *Sélys-Longch. Faun. Belge*, p. 210, pl. 6. fig. 1; *Cuv. & Val.* xvii. p. 198.

—— jeses, *Sélys-Longch. l. c.* pl. 6. fig 2.

—— rutiloides, *Sélys-Longch. l. c.* pl. 7. fig. 2; *Cuv. & Val.* xvii. p. 153; *Jeitteles, Verhandl. zool.-bot. Ges. Wien*, 1862, p. 4.

Leuciscus pausingeri, *Heckel & Kner, l. c.* p. 172. fig. 92.
—— pallens, *Blanchard, Poiss. France,* p. 386.

D. 13–14. A. 12–14. V. 10. L. lat. 42–44. L. transv. $\frac{7\text{–}8}{5\frac{1}{2}}$.
Vert. $\frac{22\text{–}23}{17\text{–}18}$.

Body generally somewhat elevated, its depth being about one-third of the total length (without caudal). Mouth terminal, the upper jaw but slightly projecting beyond the lower. There are three longitudinal series of scales between the lateral line and ventral fin. Origin of the dorsal fin above, but not in advance of, the root of the ventral. Body silvery, the lower fins generally with a red tinge in adult examples. Pharyngeal teeth 6 or 5—5 (or 6).

Europe, north of the Alps.

a–c. Adult: skins. Loch Lomond. Purchased of Mr. Parnell.
d. Many young specimens: skins. Loch Maben. Purchased of Mr. Parnell.
e. Adult: skin. Solway. Purchased of Mr. Parnell.
f. Adult: skin. River Esk (Cumberland). Purchased of Mr. Parnell.
g. Adult. Medway. Presented by Sir J. Richardson.
h–i. Young. London. From Yarrell's Collection.
k. Many half-grown specimens. River Severn. Presented by Dr. A. Günther.
l. Adult. England. Presented by G. Fennell, Esq.
m. Adult. England. Presented by Mr. Cole.
n–p. Adult and half-grown: skins. England.
q–s. Adult. Munio River (Lapland).—Pharyngeal teeth black.
t–v. Adult. Gestrickland, Sweden. Purchased of Mr. Wheelwright.
w–x. Adult. Gefle, Sweden. Purchased of Mr. Wheelwright.
y–z. Adult. Gardsjö, Sweden. Presented by Dr. A. Günther.
α, β–ε. Adult. Lake Wenern.
ζ–η. Adult. Berlin. Presented by Professor Peters.
θ. Adult. Holland. From Dr. Bleeker's Collection.
ι–κ. Half-grown: skins. Holland. From Gronow's Collection.
λ, μ, ν–ο. Adult, half-grown, and young. River Maine. Presented by Dr. A. Günther.
π–ρ, σ–τ. Adult. River Neckar. From the Stuttgart Collection.
υ–φ. Adult. River Brenz (Würtemberg). From the Stuttgart Collection.
ψ, ξ. Adult. Switzerland. Presented by Professor L. Agassiz.
ω. Adult. Lake of Geneva. Presented by W. C. M'Intosh, M.D.
a′–a″. Half-grown: stuffed. Vevey. From Yarrell's Collection.—*L. prasinus.*
b′–c′, d′–e′. Fine specimens. Ulm. From the Stuttgart Collection.
f′–g′, h′–k′. Fine specimens. Munich. From Dr. Gemminger's Collection.
l′–m′, n′–p′. Adult and half-grown. Olmütz. From Hr. Jeitteles's Collection.—*L. rutiloides.*
q . Adult: skeleton. Berlin. From Dr. A. Günther's Collection.

Hybrid between Leuciscus rutilus and Leuciscus erythrophthalmus.

(*Scardiniopsis*, Jäckel.)

The practice initiated by Professor v. Siebold, to give to fishes known to be hybrids not only specific but also generic names, has already been followed by a Bavarian naturalist, A. J. Jäckel, who, having discovered a supposed hybrid between the Rudd and Roach, describes it under the high-sounding denomination of *Scardiniopsis anceps,* mihi. It is said to have the pharyngeal teeth deeply serrated, sometimes in one series, 5—5, sometimes in two, 5 or 6 . 1 or 2—1 or 2 . 5. The mouth is terminal, more or less oblique; body more or less elevated. Origin of the dorsal fin in the vertical from the extremity of the axillary scale of the ventral fins. L. lat. 40-42. Seven longitudinal series of scales above the lateral line, and four between it and the ventral fin. D. 13. A. 14-15. Specimens of this hybrid were found in Bavaria, and are described in Abhandl. zool.-miner. Vereins Regensb. 1864, p. 64, and 1865, p. 44.

We may mention here that the fish shortly noticed by Valenciennes as *Leuciscus affinis* (Cuv. & Val. xvii. p. 150) was believed by fishermen to be a hybrid between the Roach and Rudd.

Hybrid between Abramis brama and Leuciscus rutilus.

(*Abramidopsis*, Siebold.)

The Pomeranian Bream. Der Leiter.
Cyprinus buggenhagii, *Bl. Fische Deutschl.* tab. 95.
Abramis leuckartii, *Heckel, in Ann. Wien. Mus.* i. p. 229, taf. 20. fig. 5; *Nordm. in Demidoff, Voy. Russ. Mérid.* iii. p. 508; *Cuv. & Val.* xvii. p. 59; *Heckel & Kner, Süsswasserf.* p. 117. fig. 61.
—— buggenhagii, *Thompson, Proc. Zool. Soc.* 1837, p. 56; or *Nat. Hist. Ireland,* iv. p. 137; *Yarrell, Brit. Fish.* 2nd edit. i. p. 391; 3rd edit. i. p. 407; *Couch, Fish. Brit. Isl.* iv. p. 42, pl. 189.
Abramis heckelii, *Sélys-Longch. Faun. Belge,* p. 217, pl. 8.
Leuciscus buggenhagii, *Cuv. & Val.* xvii. p. 53.
Abramidopsis leuckartii, *Siebold, Süsswasserf.* p. 117. fig. 61; *Jäckel, Abhandl. zool.-mineral. Ver. Regensb.* 1864, p. 38; 1865, p. 36.

It is due to the researches of Professor von Siebold that this fish is shown to be in all probability a hybrid between the common Bream (*Abramis brama*) and some species of *Leuciscus,* which can hardly be any other than the Roach. The Pomeranian Bream is a Roach-like modification of the Bream or a Bream-like modification of the Roach, but, as is always the case with hybrids, some of the apparently most essential characters are subject to variation.

The pharyngeal teeth are in a single series, though Siebold has met with rare exceptions in which an additional tooth was placed in a second series. Anal fin with eighteen or nineteen rays. Back of the trunk not compressed into an edge; belly behind the ventrals compressed into an edge, which, however, is covered with angularly bent scales. Snout short, obtuse, mouth terminal, with the jaws nearly even. The height of the body is contained twice and three-fourths or thrice in the total length (without caudal). L. lat. 48-50.

L. transv. $\frac{10\frac{1}{2}}{7}$; five longitudinal series of scales between the lateral line and ventral fin.

This fish may occur in all localities in which *A. brama* and *L. rutilus* are found.

a. Fine specimen, 11 inches long. Tributary of the Colne, near Hanworth, Middlesex. Presented by Greville Fennell, Esq.
b. Half-grown. Avon. Presented by R. F. Tomes, Esq.
c–e. Adult (14 inches) and half-grown: skins. England. From Yarrell's Collection.
f. Half-grown. Holland.
g–h. Adult and half-grown. Berlin. Presented by Professor Peters.
i. Adult. Danube. Presented by Professor von Siebold.
k. Half-grown. Danube. From Dr. Gemminger's Collection.
l. Half-grown. Kochel-See. Presented by Professor von Siebold.

Hybrid between Abramis blicca and Leuciscus rutilus.

Abramis abramo-rutilus, *Holandre, Faune du départ. de la Moselle*, p. 246.
—— buggenhagii, *Sélys-Longch. Faune Belge*, p. 216.
Bliccopsis abramo-rutilus, part., *Siebold, Süsswasserf.* p. 142.
abramo-rutilus, *Jäckel, Abhandl. zool.-miner. Ver. Regensb.* 1864, p. 53; 1865, p. 40.

This hybrid is very similar to that between the Bream and Roach, and to that between *A. blicca* and *L. erythrophthalmus*; and specimens may occur which cannot be referred positively to one of these forms. The pharyngeal teeth are sometimes in a double, sometimes in a single series. Anal fin with from fourteen to eighteen rays. Back of the trunk not compressed into an edge; belly behind the ventrals compressed into an edge, dividing, or covered by, the scales. Mouth terminal, with the jaws even. The height of the body is contained about twice and two-thirds in the total length (without caudal). L. lat. 43–46. L. transv. $\frac{8\frac{1}{2}-10}{7\frac{1}{2}}$. Four and a half longitudinal series of scales between the lateral line and ventral fin.

These hybrids have been observed in Holland, Belgium, and Germany.

a. Nine inches long. Chiem-See, Bavaria. Presented by Professor von Siebold.

2. Leuciscus aula.

Triotto.
Gardonus, *Bellon. Aquat.* i. p. 317.
Squalius aula, *Bonap. Faun. Ital. Pesc.*
—— elatus, *Bonap. l. c*
Leuciscus fucini, *Bonap. l. c.*; *Cuv. & Val.* xvii. p. 152.
? Leuciscus trasimenicus, *Bonap. l. c. Cuv. & Val.* xvii. p. 195.
—— rubella, *Bonap. l. c. Cuv. & Val.* xvii. p. 158.
?—— lascha, *Costa, Faun. Nap. Pesc.* p. 19, t. 16.
—— dobula (?), *Costa, l. c.* p. 23, tav. 19*

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* The fish represented is very similar to a *Leuciscus rutilus*.

? Leuciscus pagellus, *De Filippi, Cenni*, p. 14.
—— scardinus, *De Filippi, l. c.*
—— pauperum, *De Filippi, l. c.* p. 15.
Leucos henlei, *Bonap.*
Leuciscus aula, *Cuv. & Val.* xvii. p. 151; *Canestrini, Arch. p. la Zool. etc.* iv. 1866, p. 95.
—— altus, *Cuv. & Val.* xvii. p. 237 (misspelling for *elatus*).
Leucos aula, *Heckel & Kner, Süsswasserf.* p. 162. fig. 86; *Steindachner, Sitzgsber. Ak. Wiss. Wien*, 1866, liii. p. 201.
—— cisalpinus, *Heckel, in Russegger's Reisen*, i. p. 1038 (name only).
—— rubella, *Heckel & Kner, Süsswasserf.* p. 164. fig. 87; *Costa, Ann. Mus. Zool. Univers. Napol.* i. p. 15.
—— basak, *Heckel & Kner, Süsswasserf.* p. 166. figs. 88, 89.

The southern representative of *L. rutilus*.

D. 11–12. A. 11–12. V. 10. L. lat. 37–46. L. transv. 8/4½. Vert. 36.

Body generally somewhat elevated, its depth being about one-third of the total length (without caudal); sometimes it is rather higher, sometimes lower. Mouth terminal, the upper jaw but slightly projecting beyond the lower. There are three longitudinal series of scales between the lateral line and ventral fin. Generally a greyish band along the side. Pharyngeal teeth 5 . 6—5.

Europe, south of the Alps.

a–b. Adult. Garda Lake. Presented by Prof. von Siebold.
c. Adult. River Rieka (Montenegro). From the Milan Museum.
d–e. Half-grown. River Narenta (Dalmatia). From the Milan Museum.

3. **Leuciscus arcasii.**

Ruivaca (Portugal); Escalo (on the Miño).
Leucos aula, *Steindachner, Catal. prélim. Poiss. d'eau douce de Portugal* (*not Bonap.*).
Leucos arcasii, *Steindachner, Sitzgsber. Ak. Wiss. Wien*, 1866, liii. p. 199, and liv. p. 14, pl. 3. figs. 2 & 3.

D. 10(–11). A. 10(–11). L. lat. 42–46. L. transv. $\frac{7-8}{?}$.

Body oblong, its depth being less than one-third of the total length (without caudal). Mouth terminal, jaws nearly even in front. There are three or four longitudinal series of scales between the lateral line and ventral fin. A greyish band along the side. (*Steind.*)

Pharyngeal teeth 5—5.

Pyrenean peninsula.

This fish appears to be scarcely different from *L. aula*.

The same author mentions and describes a fish which he considers to be a *hybrid* between *Chondrostoma polylepis* and *Leuciscus arcasii*, *l. c.* p. , pl. 4. fig. 2. The number of scales of this supposed hybrid is said to be intermediate between those of the two parent fishes.

4. Leuciscus macrolepidotus.

Ruivaca (Portugal).
Steindachner, Sitzgsber. Ak. Wiss. Wien, 1866. liv. pp. 15, 272, taf. 1. fig. 4.

D. 10. A. 10(–11). V. 9–10. L. lat. 33–36. L. transv. 7/4½.

Body oblong, its depth being contained thrice and two-thirds in the total length (without caudal). Mouth terminal, the upper jaw slightly overlapping the lower. There are two and a half longitudinal series of scales between the lateral line and ventral fin. An indistinct greyish band along the side.

Portugal.

a. Four inches long. River d'Alco-boça. Presented by Dr. B. du Bocage.
b–c. Three and four inches long. Coimbra. Presented by Dr. B. du Bocage.
d. Three inches long. Cintra. Presented by Dr. B. du Bocage.

5. Leuciscus alburnoides.

Leuciscus (Leucos) alburnoides, *Steindachner, Sitzgsber. Ak. Wiss. Wien,* liv. 1866, p. 263, taf. 1. fig. 3.

D. 10. A. 10–12. L. lat. 39–40. L. transv. $\frac{8\frac{1}{2}-9\frac{1}{2}}{?}$.

Body elongate, its depth being equal to the length of the head, and two-ninths of the total (without caudal). Mouth terminal, obliquely ascending upwards as in *Alburnus*. There are two and a half longitudinal series of scales between the lateral line and ventral fin. A dark band along the side, above the lateral line. (*Steind.*)

Pharyngeal teeth 5—5.

Spain.

6. Leuciscus arrigonis.

Steindachner, Sitzgsber. Ak. Wiss. Wien, 1866, liv. p. 16, pl. 4. fig. 1.

D. 10–11. A. 11–13. V. 10. L. lat. 46–52. L. transv. $\frac{8}{?}$.

Body longish, its depth being rather less than one-fourth of the total length (without caudal). Mouth inferior, the upper jaw overlapping the lower. There are four and a half or five longitudinal series of scales between the lateral line and ventral fin. A blackish band along the side. Pharyngeal teeth 6 . 5. (*Steind.*)

Spain. (Rio Jucar; Lake of Uña.)

7. Leuciscus heckelii.

Leuciscus heckelii, *Nordm. in Demid. Voy. Russ. Mérid.* iii. p. 491, *Poiss.* pl. 23. fig. 1.

D. 13. A. 12–13. L. lat. 43–46. L. transv. 8/6.

Body rather elevated, its depth being about two-fifths of the total length (without caudal). Mouth subinferior, the upper jaw projecting beyond the lower There are four and a half longitudinal series of scales between the lateral line and ventral fin. Origin of the dorsal fin slightly in advance of, or opposite to, the root of the first ventral ray. Coloration uniform, fins blackish towards the margin. (*Nordm.*)

Pharyngeal teeth?

Crimea.

8. **Leuciscus pigus.**

Frauenfisch. Nerfling. Pigo.
Vraw-fish, *Willughby*, p. 253.
Orfus germanorum, *Marsil. Danub. Pan.-Mys.* p. 13, tab. 5.
Cyprinus pigus, *Lacép.* v. pp. 607, 610.
—— idus, *Meidinger*, no. 36; *Agassiz, in Isis*, 1828, p. 1047.
—— jeses, *Schrank, Faun. Boica*, p. 334.
? Cyprinus rutilus, *Jurine, Mém. Soc. Hist. Nat. Genèv.* iii. pl. 13.
Leuciscus pigus, *De Filippi, Cenni*, p. 11; *Heckel & Kner, Süsswasserf.* p. 173, pl. 93; *Canestr. Arch. p. la Zool.* iv. 1866, p. 100.
—— virgo, *Heckel, Sitzgsber. Akad. Wiss. Wien*, 1852, ix. p. 69, taf. 11 & 12; *Wagner, in Gelehrte Anzeigen d. Bayr. Akad.* xxxix. 1854, p. 69; *Heckel & Kner, Süsswasserf.* p. 174. figs. 94–96; *Siebold, Süsswasserf.* p. 191; *Rapp, Fische d. Bodensee's*, p. 9; *Veesenmeyer, Würtemb. ntrwiss. Jahresh.* 1859, p. 47; *Jeitteles, Fische d. March*, ii. 1864, p. 13.
? Leuciscus jurinii, *Dybowski, Cypr. Livlands*, p. 94.

D. 12–14. A. 14. V. 10. L. lat. 46–49. L. transv. $7\frac{1}{2}$–8/7. Vert. 27/19.

The height of the body is two-sevenths of the total length (without caudal), the length of the head one-fifth. Mouth inferior, the upper jaw conspicuously projecting beyond the lower. There are three and a half or four longitudinal series of scales between the lateral line and ventral fin. Coloration uniform.

Pharyngeal teeth 6 or 5—5.

Danube; Northern Italy.

a, b, c, d–f. Adult and half-grown. Danube.
g. Adult. Milan. Presented by Prof. v. Siebold.
h. Adult: skin. Lago Maggiore. Presented by T. C. Eyton, Esq.
i. Adult: skeleton. Danube. From the Stuttgart Collection.

Leuciscus roseus, Bonap. Faun. Ital. Pesc., from Lakes of Piedmont, is a very doubtful species. Canestrini (Arch. p. la Zoolog. etc. iv. 1866, p. 58) also is uncertain about its specific validity; he says that it is, at all events, closely allied to *L. pigus*.

Chondrostoma ryzela, Bonap. l. c. (not Agass.), or *Leuciscus ryzela*, Cuv. & Val. xvii. p. 199 (omitted in Canestrini's list of Italian Fish, *ut supra*) is probably also the same fish.

9. **Leuciscus pictus.**

Squalius pictus, *Heckel & Kner, Süsswasserf.* p. 196.

D. 11. A. 11–12. V. 8. L. lat. 43–44. L. transv. $8\frac{1}{2}$/6.

Lips remarkably thick, the lower extending across the symphysis as a distinctly continuous fold. The height of the body equals the length of the head, and is one-fourth of the total (without caudal).

The diameter of the eye is two-ninths of the length of the head, two-thirds of that of the snout, and rather more than one-half of the width of the interorbital space. Cleft of the mouth oblique, not reaching to the vertical from the front margin of the orbit; lower jaw overlapped by the upper. Origin of the dorsal fin opposite to the root of the ventrals, and considerably nearer to the base of the caudal than to the end of the snout. Pectoral fin terminating at some distance from the ventral. Scales with numerous striæ. There are three longitudinal series of scales between the lateral line and ventral fin. Body irregularly mottled with brown.

Montenegro.

a–c. Adult and half-grown. River Rieka. From the Milan Museum.

10. Leuciscus friesii.

Frauenfisch, or Perlfisch.

Cyprinus grislagine, *Meidinger*, tab. 40; *Agassiz, in Isis*, 1828, p. 1047.

Leuciscus idus, *Perty, in Isis*, 1832, p. 719.

—— grislagine, *Perty, l. c.*; *Cuv. & Val.* xvii. p. 221.

—— frisii, *Nordm. in Demid. Voy. Russ. Mérid.* iii. p. 487 (1840); *Heckel, Sitzgsber. Ak. Wiss. Wien*, 1852, ix. p. 94, taf. 10.

—— meidingeri, *Heckel, Sitzgsber. Ak. Wiss. Wien*, 1852, ix. p. 88, taf. 14; *Heckel & Kner, Süsswasserf.* p. 178. figs. 97 & 98; *Siebold, Süsswasserf.* p. 196.

D. 11–12. A. 12–14. V. 10–11. L. lat. 61–67. L. transv. 11/8. Vert. 26/17.

The height of the body is one-fourth or two-ninths of the total length (without caudal), the length of the head two-ninths. Mouth inferior, the upper jaw more or less conspicuously projecting beyond the lower. There are five longitudinal series of scales between the lateral line and ventral fin. Coloration uniform.

Pharyngeal teeth 6—5, club-shaped.

A lake-fish from Bavaria; European Turkey; Odessa.

a, b. Adult male (with tubercles) and female. Chiem-See, Bavaria. Presented by Professor v. Siebold.

c–d. Adult (20 inches). Lake of Derkos (Constantinople). From Mr. Millingen's Collection.

e. Adult skeleton. Lake of Derkos (Constantinople). From Mr. Millingen's Collection.

11. Leuciscus lemmingii.

Leuciscus lemmingii, *Steindachner, Sitzgsber. Ak. Wiss. Wien*, 1866, liv. p. 265, taf. 1. fig. 2.

D. 10. A. 10. L. lat. 59–63. L. transv. $\frac{12\text{–}13}{?}$.

The height of the body is more than the length of the head, which is one-fifth of the total (without caudal). Mouth small, inferior, subsemicircular. There are six longitudinal series of scales between the lateral line and ventral fin. Body with irregular blackish dots, and with a dark lateral band. (*Steindachner.*)

Pharyngeal teeth 5 or 6—5.

Spain.

12. **Leuciscus adspersus.**

Leucos adspersus, *Heckel, in Russegger's Reisen,* i. p. 1038; *Heck. & Kner, Süsswasserf.* p. 167, fig. 90.

D. 10. A. 10. V. 9. L. lat. 58–60. L. transv. $\frac{15\text{–}16}{?}$.

The height of the body is one-fourth of the total length (without caudal), and nearly equal to the length of the head. Mouth anterior. There are six or seven longitudinal series of scales between the lateral line and ventral fin. Body with numerous dark-brown spots. (*Heck.*)

Pharyngeal teeth 5—5.

Dalmatia (lake near Imosky). Four inches long.

2. *Anal fin with nine rays; dorsal fin inserted behind the ventrals* (Pseudophoxinus).

13. **Leuciscus zeregi.**

Phoxinellus zeregi, *Heckel, in Russegger's Reisen,* i. p. 1063, taf. 6. fig. 3.

D. 10. A. 9. V. 7. L. lat. 57–66.

Mouth anterior. Upper jaw scarcely overlapping the lower; body somewhat compressed, its depth being nearly equal to the length of the head, which is one-fourth of the total (without caudal). Sides and belly silvery, a more or less distinct blackish band along the middle of the side. Gill-rakers very short and few in number; pseudobranchiæ present. Pharyngeal teeth 5—5, slightly compressed, uncinate.

Aleppo; Lake of Galilee.

a–b. Two and a half inches long, not in good state. Lake of Galilee. Collected by Th. W. Beddome, Esq.

B. *Pharyngeal teeth in a double series.*

1. *Lateral line complete.*

14. **Leuciscus cephalus.**

The Chub or Skelly. Der Aitel, Dick-Kopf or Schuppfisch. Le Meunier or Chevaine. Färna (Swed.). Squaglio or Cavedano.

Squalus, Chevesne, etc., *Bellon.* p. 315; *Salvian.* p. 83.

Capito fluviatilis, *Rondel. De Pisc. Fluv.* p. 190; *Gesner,* p. 1266; *Aldrov.* p. 603.

Mugil fluviatilis, *Willughby,* p. 261.

Chub *Willughby,* p. 255, tab. 24. fig. 2; *Pennant, Brit. Zool.* iii. p. 322, pl. 73, and ed. 1812, iii. p. 485, pl. 84; *Yarrell, Brit. Fish.* i. p. 358; 2nd edit. i. p. 409; 3rd edit. i. p. 421 (not figure); *Couch, Fish. Brit. Isl.* iv. p. 44, pl. 190.

Squalus major, *Schwenckfeld,* p. 446.

Cyprinus, sp., *Artedi, Gen. Pisc.* p. 5. no. 12; *Synon.* p. 7. no. 10;

Gronov. Zoophyl. p. 103. no. 333; and *Zoophyl.* p. 105. no. 334, or *Mus. Ichthyol.* i. p. 4, no. 17 (juv.).
Capito ausonii s. cephalus, *Marsil. Danub. Pan.-Mys.* iv. p. 11, tab. 9. fig. 1.
Naddi, L. Act. Soc. Sc. Upsal. 1744–50, p. 35, tab. 3.
Cyprinus cephalus, *L. Syst. Nat.* i. p. 527; *Jenyns, Man.* p. 411; *Fries & Ekstr. Skand. Fisk.* p. 67; *Gronov. Syst.* ed. *Gray*, p. 184.
—— idus, *Bloch, Fische Deutschl.* i. p. 253, taf. 36.
—— jeses, *Donovan, Brit. Fish.* v. pl. 115; *Fries & Ekström, l. c.* pl. 13; *Jurine, Poiss. Lac Lém. in Mém. Genèv.* iii. p. 207, pl. 11.
—— dobula, *Nilss. Prodr.* p. 26; *Gronov. Syst.* ed. *Gray*, p. 185 (juv.).
Leuciscus cephalus, *Flem. Brit. Anim.* p. 187; *Kröyer, Danm. Fisk.* iii. p. 482.
—— dobula, *Agass. Mém. Neuchât.* i. p. 38; *Sélys-Longch. Faune Belge*, p. 206; *Cuv. & Val.* xvii. p. 172; *Günth. Fische d. Neckars*, p. 69; *Rapp, Fische d. Bodensee's*, p. 7.
—— frigidus, *Cuv. & Val.* xvii. p. 234.
—— latifrons, *Nilss. Skand. Faun.* iv. p. 309; *Heckel, in Sitzgsber. Ak. Wiss. Wien*, 1852, ix. pp. 76, 80.
Squalius dobula, *Heckel & Kner, Süsswasserf.* p. 180. figs. 99 & 100, tab. 8.
—— meunier, *Heckel, l. c.* p. 76; *Jeitteles, Verhandl. zool.-bot. Ges. Wien*, 1862, p. 6.
—— cephalus, *Heckel, l. c.* p. 77; *Siebold, Süsswasserf.* p. 200; *Malmgren, Wiegm. Arch.* xxx. p. 319; *Dybowski, Cyprin. Livlands*, p. 119; *Jeitteles, Fische d. March*, ii. 1864, p. 14; ?*Steindachner, Sitzgsber. Ak. Wiss. Wien*, 1866, liv. p. 262; *Blanchard, Poiss. France*, p. 392.
Leuciscus cavedanus, *Bonap. Faun. Ital. Pesc.*: *De Filippi, Cenni*, p. 12; *Cuv. & Val.* xvii. p. 196.
—— tiberinus, *Bonap. l. c.*
—— pareti, *Bonap. l. c.*
—— squalus, *Bonap. l. c.*
? Leuciscus albus, *Bonap. l. c.*; *Cuv. & Val.* xvii. p. 192.
Leuciscus squalius, *Cuv. & Val.* xvii. p. 191.
—— albiensis, *Cuv. & Val.* xvii. p. 194.
Squalius thyberinus, *Heckel, l. c.* p. 69.
—— cavedanus, *Heckel & Kner, Süsswasserf.* p. 184. fig. 101; *Canestrini, Arch. p. la Zool. etc.* 1866, iv. p. 103.
—— albus, *Heckel & Kner, l. c.* p. 198. fig. 111.
Leuciscus cii, *Richards. Proc. Zool. Soc.* 1856, p. 375.
Squalius meridionalis, *Blanchard, Poiss. France*, p. 396.
—— clathratus, *Blanchard, l. c.* p. 398.

D. 11. A. 11 (12). V. 10. L. lat. 42–46. L. transv. 7½/6½.
Vert. 25/18, 25/19, 26/18, 26/19.

Body oblong, its depth being one-fourth, or rather more than one-fourth, of the total length (without caudal). Head very broad, the width of the interorbital space being about two-fifths of the length of the head. Mouth wide, its cleft extending to below the front margin of the orbit; upper jaw slightly overlapping the lower. The hindmost suborbital bone is rather larger than the first, *the width of the third much less than that of the last.* Origin of the dorsal fin opposite to the root of the inner ventral rays. Length of the ventral fin more than one-half of that of the head. There are three longitudinal series of scales between the lateral line and ventral fin.

Coloration uniform; margins of the scales greyish. Pharyngeal teeth hooked, slightly denticulated 5 . 2—2 . 5.

Europe (Pyrenean peninsula?); Asia Minor.

a–d. Adult: stuffed. River Annan, Scotland. Purchased of Mr. Parnell.
e–f. Young: skin. River Annan. Purchased of Mr. Parnell as "*Leuciscus dobula*."
g–h. Adult: skins. River Esk, Cumberland. Purchased of Mr. Parnell.
i–k. Young: stuffed. River Colbeck, Yorkshire. Purchased of Mr. Parnell.
l–m. Half-grown. Matlock. Presented by Dr. A. Günther.
n. Adult: stuffed. Cambridgeshire.
o. Half-grown. London. Presented by S. Gray, Esq. Body covered with black tubercles.
p–u. Adult and half-grown: skins. British.
v–w. Adult. Gotha River, Sweden. From Mr. Lloyd's Collection.
x. Young. Lake Wenern. Presented by Dr. A. Günther.
y. Fine specimen. Bohuslän. Presented by Hr. A. W. Malm.—*Leuciscus latifrons*.
z. Half-grown. Holland. From Dr. Bleeker's Collection.
α, β. Adult, and half-grown: skins. Holland. From Gronow's Collection.
γ–ε. Fine specimens. River Neckar. From the Stuttgart Collection.
ζ. Fine specimen. Lake of Constance. From the Stuttgart Collection.
η–θ. Fine specimens. Danube. From the Stuttgart Collection.
ι–λ. Young. River Würm, Bavaria. From Dr. Gemminger's Collection.
μ–ν. Young. River Amper, Bavaria. From Dr. Gemminger's Collection.
ξ, ο. Half-grown and young. Olmütz. From Hr. Jeitteles's Collection.
π. Adult. Switzerland. Presented by Prof. L. Agassiz.
ρ. Adult: stuffed. Lake of Geneva. From Yarrell's Collection.
σ. Half-grown. Dalmatia. From Dr. J. Heckel's Collection as "*Leuciscus albus*."
τ. Adult. Lago di Garda. Presented by Prof. v. Siebold (*L. cavedanus*).
υ. Half-grown: skin. Lago Maggiore. Presented by T. C. Eyton, Esq.
φ–ω. Adult and half-grown. Col de Tendi, Alpes Maritimes. From Dr. Deakin's Collection.
a'–c', d'–h'. Adult, half-grown, and young. Nice. From Dr. Deakin's Collection.
i'–m'. Young. Lake of St. Stephanos, Rumelia. Purchased of Mr. Millingen.—L. lat. 41.
n–o, p–q'. Young. River Gemlek, Anatolia. Presented by H. Poole, Esq.—Types of *Leuciscus cii* (Richards.).

r′–u′. Adult: skeletons. Holland. Purchased of Mr. Damon.
v′. Adult: skull. Lake of Constance. From Dr. A. Günther's Collection.

Hybrid between Leuciscus dobula and Alburnus lucidus.

Leuciscus dolabratus, *Holandre, Faune du Départ. de la Moselle*, 1836, p. 248; *Cuv. & Val.* xvii. p. 248; *Günth. Fishe d. Neckars*, p. 90.
Leuciscus (Squalius) dolabratus, *Sélys-Longch. Faun. Belge*, p. 207, pl. 5. fig. 5.
Abramis dobuloides, *Günth. Würtemb. ntrw. Jahresh.* 1857, p. 50, taf. 2.
Alburnus tauricus, *Kessler, Bull. Soc. Nat. Mosc.* 1859, xxxii. p. 534.
—— dolabratus, *Siebold, Süsswasserf.* p. 164. figs. 23 & 24; *Jäckel, Abhandl. zool.-miner. Ver. Regensb.* 1865, p. 41.
Alburnus dobuloides, *Jeitteles, Fische d. March*, ii. 1864, p. 8.

D. 11. A. 13–16. V. 9–11. L. lat. 45–54. L. transv. $\frac{7-8}{6}$.
Vert. 22/21.

Body rather elongate, its depth being one-fourth or somewhat less than one-fourth, of the total length (without caudal) Snout as long as, or rather longer than, the eye; cleft of the mouth moderately oblique, the jaws being even in front, or the lower rather the longer. The abdomen is slightly compressed behind the ventrals, the scales reaching across the keel. There are three longitudinal series of scales between the lateral line and ventral fin. The origin of the anal fin is behind the end of the dorsal. Scales of adult examples with a dark margin.

This hybrid appears to occur in all localities inhabited by *Alburnus lucidus* and *L. dobula*.

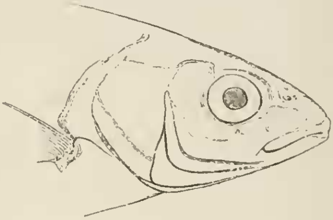
a. Adult. River Mole. Presented by W. T. Tegetmeier, Esq.
b. Adult. River Neckar. Presented by Dr. A. Günther.—*A. dobuloides*.
c. Adult. River Neckar. From the Stuttgart Collection.
d–e. Large example (11 inches) and half-grown. River Amper, Bavaria. From Dr. Gemminger's Collection.
f. Adult. Olmütz. From Hr. Jeitteles's Collection.
g. Adult: skeleton. Neckar. From Dr. A. Günther's Collection.

15. Leuciscus pyrenaicus.

Escalo (Portugal).
? Leuciscus cephalus, *Steindachner, Sitzgsber. Ak. Wiss. Wien*, 1866, liv. pp. 18, 262.

D. 11. A. 11 (12). V. 10. L. lat. 42–44. L. transv. 8/6.
Vert. 40.

The height of the body equals the length of the head, and is one-fourth of the total (without caudal). Head rather broad, *the width of the interorbital space being contained twice and two-thirds in the length of the head.* The diameter of the eye is less than the extent of the snout, and contained four times and two-thirds in the length of the head, and once and two-thirds in the width of the interorbital space. Upper surface of the head slightly convex. Mouth of moderate width, the cleft reaching scarcely to the front margin of the orbit; jaws nearly even in front. The hindmost suborbital is rather larger than the first; *the intermediate part of the ring broad, the third bone being scarcely narrower than the fourth or last.* The origin of the dorsal fin is a little behind the root of the ventrals, opposite to the fifteenth or sixteenth scale of the lateral line. Anal with the lower margin straight, not much higher than long. Caudal fin emarginate. The pectoral terminates at a great distance from the ventrals, and is as long as the head, without snout. Length of the ventral fin more than one-half of that of the head. Scales with numerous radiating striæ. There are three longitudinal series of scales between the lateral line and ventral fin. Coloration more or less uniform; sometimes a well-defined brown spot at the base of each scale, the spots forming longitudinal series. Pharyngeal teeth hooked, slightly denticulated, 5 . 2—2 . 5.



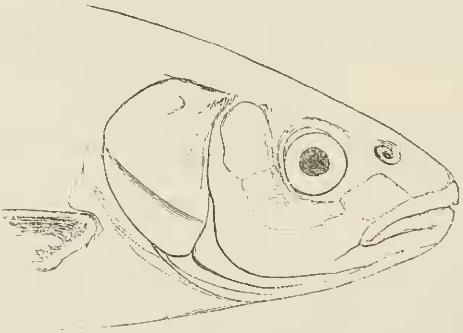
Portugal. (? Spain.)

a, b, c–d. From 5 to 7 inches long. River Mendego, Coimbra. Presented by Dr. Barboza du Bocage.

e, f–h. From 3 to 6 inches long. Cintra. Presented by Dr. Barboza du Bocage.

16. **Leuciscus fellowesii.**

D. 11. A. 11. V. 9. L. lat. 43. L. transv. 8/6.



Body oblong, its depth being one-fourth of the total length (without caudal); the length of the head is contained four times and one-third in it. Head very broad; *the interorbital space is convex, and its width contained twice and one-third in the length of* *the head.* Eye small, its diameter being more than one-half of the length of the snout, and contained five times and a half in that of the head. Mouth of moderate width, its cleft not extending to the vertical from the front margin of the eye. Upper jaw scarcely overlapping the lower. The hindmost suborbital bone is larger than the first; *the width of the penultimate is not much less than that of the last.* Origin of the dorsal fin opposite to the root of the inner ventral rays, a little nearer to the base of the caudal than to the end of the snout; pectoral fin extending to the twelfth scale of the lateral line, the root of the ventral being opposite to the fifteenth; ventral fin nearly as long as the head without snout; caudal moderately emarginate. Scales with numerous fine radiating striæ; three longitudinal series of scales between the lateral line and the root of the ventral. Coloration uniform silvery.

Pharyngeal teeth 5 . 2—2 . 5, hooked, scarcely denticulated.

Xanthus.

a–b. Nine and four inches long. Presented by Sir Ch. Fellowes.

17. Leuciscus berak.

Squalius berak, *Heckel, in Russegger's Reisen*, i. p. 1078, taf. 10. fig. 1.

D. 10. A. 11. L. lat. 42–43. L. transv. 7/?.

The height of the body is more than one-fourth of the total length (without caudal). Interorbital space broad and flat. Eye small. Cleft of the mouth oblique, of moderate width, not extending to below the front margin of the eye; jaws even in front. The width of the third suborbital bone is much less than that of the last. Origin of the dorsal fin opposite to the root of the inner ventral rays; *length of the ventral fin rather less than half that of the head.* There are three longitudinal series of scales between the lateral line and ventral fin. Coloration uniform, each scale darker at the base. (*Heck.*)

Aleppo.

Squalius turcicus, De Filippi, Viaggio in Persia, p. 359, appears to be closely allied to *L. berak*. It is described thus:—Very similar to *S. cavedanus*; mouth oblique, lower jaw somewhat prominent. The diameter of the eye is one-fifth of the length of the head, which is equal to the height of the body, and *about* one-fifth of the total length (with the caudal). Forehead flat, broad. Origin of the dorsal fin in the vertical from the sixteenth scale of the lateral line; anal fin rounded. D. 10. A. 11. L. lat. 41. L. transv. 7/3.—Vicinity of Erzerum.

18. Leuciscus orientalis.

Squalius cephalopsis, *Heckel, in Russegger's Reisen*, i. p. 1080.
—— orientalis, *Heckel, l. c.* ii. 3. p. 225, taf. 16. fig. 2.

D. 11. A. 10. L. lat. 40–41. L. transv. 7/?.

The height of the body is more than one-fourth of the total length (without caudal). The width of the interorbital space is about two-fifths of the length of the head. Eye rather small. Cleft of the mouth slightly oblique, of moderate width, not extending to below the front margin of the eye; jaws nearly even in front. The width of the third suborbital bone is much less than that of the last. Origin of the dorsal fin opposite to the root of the inner ventral rays. Length of the ventral fin more than half that of the head. There are three longitudinal series of scales between the lateral line and ventral fin. Coloration uniform, each scale darker at the base. (*Heck.*)

Aleppo.

Telestes leucoides, De Filippi, Viagg. Pers. p. 359, appears to be a species very closely allied to the preceding; it is characterized thus:—"Habitus, corporis proportiones, pictura, uti in *Leucode aula*. Pinna dorsalis ventralibus retroposita. D. 10. A. 11. L. lat. 40. L. transv. 7/4." From a rivulet near Batum in Persia.

19. **Leuciscus lepidus.**

Baraan.

Squalius lepidus, *Heckel, in Russegger's Reisen*, i. p. 1079, taf. 10. fig. 2.

D. 11. A. 12–13. L. lat. 48–49. L. transv. 7/?.

The height of the body is rather less than one-fourth of the total length (without caudal). Interorbital space broad, its width being two-fifths of the length of the head. Eye rather small. Cleft of the mouth oblique, of moderate width, *with the lower jaw slightly projecting beyond the upper*. The second and third suborbital bones are narrow. Origin of the dorsal fin opposite to the root of the inner ventral rays. There are three longitudinal series of scales between the lateral line and ventral fin. Coloration uniform. (*Heck.*)

River Tigris.

20. **Leuciscus vulgaris.**

The Dace; the Graining. Der Hasel. La Vandoise. Stämm (Swed.).

Vandoise, *Bellon.* p. 314.

Leucisci 2da species, *Rondel. De Pisc. Fluv.* p. 192; *Gesner, De Aquat.* p. 26; *Aldrovand.* p. 607.

Squalus minor, *Schwenckfeld*, p. 446; *Marsil. Danub. Pan.-Mys.* iv. tab. 4.

Dace, *Willughby*, p. 260, tab. Q. 10. fig. 3; *Penn. Brit. Zool.* iii. p. 320, or, edit. 1812, iii. p. 483; *Couch, Fish. Brit. Isl.* iv. p. 54, pl. 194.

Cyprinus, sp., *Artedi, Gen.* p. 5. no. 13; *Synon.* p. 5. no. 4 (not synon.), p. 9. no. 16, ? p. 10. no. 17.

Cyprinus grislagine, *L. Syst. Nat.* p. 592; *Fries & Ekstr. Skand. Fisk.* p. 69 (latin), pl. 14.

—— leuciscus, *L. l. c.* p. 528; *Bloch, Fische Deutschl.* iii. p. 141, taf. 97. fig. 1; *Bl. Schn.* p. 440; *Lacép.* v. p. 572; *Pallas, Zoogr. Ross.-As.* iii. p. 318; *Donovan, Brit. Fish.* iv. p. 77; *Turton, Brit. Faun.* p. 109; *Jenyns, Manual*, p. 410; *Gronov. Syst.* ed. *Gray*, p. 184.

? Cyprinus dobula, *L. l. c.* p. 528.

Graining, *Pennant, Brit. Zool.* iii. p. 321; edit. 1812, iii. p. 484.

Cyprinus dobula, *Bloch, Fische Deutschl.* i. p. 42, tab. 5; *Bl. Schn.*

p. 435; *Lacép.* v. p. 573; *Meidinger*, tab. 26 (copied from *Bloch*); *Jenyns, Man.* p. 409; *Yarrell, Trans. Linn. Soc.* xvii. p. 9.
Cyprinus lancastriensis, *Shaw, Gen. Zool.* v. p. 234; *Jenyns, Man.* p. 411.
—— graining, *Walb., Artedi*, iii. p. 36.
—— simus, *Römer-Büchner, Verzeichniss der Steine und Thiere in dem Gebiete von Frankfurt*, 1827, p. 68.
Leuciscus vulgaris, *Fleming, Brit. An.* 1828, p. 187; *Yarrell, Brit. Fish.* i. p. 353; 2nd edit. i. p. 404; 3rd edit. i. p. 428; *Heckel, Ann. Wien. Mus.* i. p. 233; *Cuv. & Val.* xvii. p. 202; *Günth. Fische d. Neckar's*, p. 65; *Rapp, Fische d. Bodensee's*, p. 9.
—— argenteus, *Agass. Mém. Soc. Sc. Nat. Neuchâtel*, i. 1835, p. 38; *Sélys-Longchamps, Faune Belge*, p. 205.
—— rostratus, *Agass. l. c.*; *Cuv. & Val.* xvii. p. 201; *Jeitteles, Verhandl. zool.-bot. Ges. Wien*, 1862, p. 8.
—— rodens, *Agass. l. c.*; *Cuv. & Val.* xvii. p. 213; *Jeitteles, l. c.* p. 7.
—— majalis, *Agass. l. c.*; *Heckel, Sitzgsber. Ak. Wiss. Wien*, 1852, ix. pp. 99, 117.
—— jaculus, *Jurine, Poiss. Lac Léman, in Mém. Soc. Sc. Nat. Genèv.* iii. pl. 14.
—— lancastriensis, *Yarrell, in Trans. Linn. Soc.* xvii. p. 7, pl. 2. fig. 1; *Brit. Fish.* i. p. 355; 2nd edit. i. p. 406; 3rd edit. i. p. 430; *Cuv. & Val.* xvii. p. 216.
—— grislagine, *Nilss. Skand. Faun. Fisk.* p. 303; *Kröyer, Danm. Fisk.* iii. p. 472.
—— dobula, *Yarrell, Brit. Fish.* i. p. 346; 2nd edit. i. p. 397; 3rd edit. i. p. 425; *Kröyer, l. c.* p. 463.
—— burdigalensis, *Cuv. & Val.* xvii. p. 218.
Squalius leuciscus, *Heckel, Sitzgsber. Ak. Wiss. Wien*, 1852, ix. pp. 99, 116; *Heckel & Kner, Süsswasserf.* p. 191. fig. 105; *Dybowski, Cyprin. Livlands*, p. 126; *Siebold, Süsswasserf.* p. 203; *Malmgren, Wiegm. Arch.* xxx. p. 319; *Blanchard, Poiss. France*, p. 401.
—— lepusculus, *Heckel, l. c.* pp. 99, 109, 116, pl. 11. figs. 1–4; *Heckel & Kner, l. c.* p. 186. fig. 102: *Jeitteles, Verhandl. zool.-bot. Ges. Wien*, 1862, p. 6; and *Fische d. March*, ii. 1864, p. 15.
—— rodens, *Heckel, l. c.*; *Heckel & Kner, l. c.* p. 189. fig. 104.
—— rostratus, *Heckel, l. c.* pp. 99, 113, taf. 13. figs. 1–4; *Heckel & Kner, l. c.* p. 192. fig. 106.
—— chalybæus, *Heckel, l. c.* p. 111, taf. 12. figs. 1–4; *Heckel & Kner, l. c.* p. 188. fig. 103.
—— bearnensis, *Blanchard, Poiss. France*, p. 400.
—— burdigalensis, *Blanchard, l. c.* p. 405.

D. 10. A. 11. V. 9–10. L. lat. 47–52. L. transv. $8\frac{1}{2}/6$.
Vert. $\frac{23\text{–}24}{19\text{–}20}$.

Body oblong, its depth being about one-fourth of the total length (without caudal). Head moderately broad, the width of the interorbital space being about one-third of the length of the head. Mouth rather narrow, its cleft scarcely extending to below the front margin of the orbit; upper jaw overlapping the lower. The hindmost suborbital bone is not larger than the first, the intermediate ones being very narrow. Origin of the dorsal fin opposite to the hind part of the root of the ventral. There are four longitudinal series of scales between the lateral line and ventral fin. Sides shining silvery. Pharyngeal teeth hooked, slightly denticulated (6)5 . 2—(3)2 . 5.

Europe north of the Alps.

a–c. Adult. Munio River, Lapland. Collected by Mr. Wheelwright.
d–e. Fine specimens. Gestrickland, Sweden. Collected by Mr. Wheelwright.—(*L. grislagine.*)
f–g. Adult. Gefle. Collected by Mr. Wheelwright.—(*C. grislagine.*)
h. Fine specimen. Upsala. Presented by Prof. Lilljeborg.—(*C. grislagine.*)
i–l. Adult. Wenern Lake. Collected by Mr. Wheelwright.
m. Many adult, half-grown, and young specimens. Gotha River. Collected by Mr. Lloyd.
n, o. Many adult and half-grown specimens. Sweden. Collected by Mr. Wheelwright.
p. Adult: skin. River Codbeck. Purchased of Mr. Parnell.
q. Several adult, half-grown, and young specimens. River Veland, Rutlandshire. Presented by Dr. A. Günther.
r. Adult. Liverpool. Presented by Mr. Yarrell.—(*Leuciscus lancastriensis.*)
s. Adult: skin. Dagenham. From Yarrell's Collection.
t. Adult: skin. River Colne. From Yarrell's Collection.
u. Adult: skin. British. Purchased of Mr. Parnell.
v–w. Fine specimens. River Maine. Presented by Dr. A. Günther.
x–z. Fine specimens. River Neckar. Presented by Dr. A. Günther.
α–δ. Fine specimens. River Neckar. From the Stuttgart Collection.
ε–η. Adult. Neuchâtel. From the Collection of Prof. L. Agassiz.
θ–κ. Fine specimens. Neuchâtel. Presented by P. L. Sclater, Esq.—(*L. rodens.*)
λ–ν. Half-grown. Neuchâtel. Presented by P. L. Sclater, Esq.—(*L. majalis.*)
ξ–π. Fine specimens. Neuchâtel. Presented by P. L. Sclater, Esq.
ρ. Several fine adult and half-grown examples. Bavaria. From Dr. Gemminger's Collection.
σ–υ. Fine specimens. Olmütz. From Hr. Jeitteles's Collection.—(*Sq. lepusculus.*)
φ. Fine specimen. Olmütz. From Hr. Jeitteles's Collection.—(*Sq. rodens.*)

21. Leuciscus svallize.

Squalius svallize, *Heckel & Kner, Süsswasserf.* p. 197. fig. 110.

The southern representative of *L. vulgaris*, from which it differs in having more anal rays.

D. 12. A. 12–13. V. 9. L. lat. 46. L. transv. 8/8.

Body oblong, its depth being equal to the length of the head, and one-fourth of the total length (without caudal). Head moderately broad, the width of the interorbital space being one-third of the length of the head. Mouth rather narrow, its cleft scarcely extending to below the front margin of the orbit; upper jaw overlapping the lower. The hindmost suborbital bone is not larger than the first, the intermediate ones being very narrow. Origin of the dorsal fin opposite to the middle of the root of the ventral. There are three longitudinal series of scales between the lateral line and ventral fin. Sides shining silvery, each scale dark at the base. Pharyngeal teeth hooked, slightly denticulated, 5 . 2—2 . 5.

Dalmatia.

a–b. Half-grown and young. River Narenta. From the Milan Museum.

22. Leuciscus illyricus.

Squalius illyricus, *Heckel & Kner, Süsswasserf.* p. 195. fig. 108.

D. 11. A. 12. L. lat. 49–54. L. transv. $\frac{10-9}{5-4}$.

Body oblong, its depth being nearly one-fourth of the total length (without caudal). Eye small. Mouth of moderate width; upper jaw overlapping the lower. Fins short and low, the dorsal and anal not being higher than long; origin of the dorsal opposite the hind part of the root of the ventrals. Scales with numerous radiating striæ. Silvery; margins of the scales blackish. (*Heck.*)

River Isonzo, Dalmatia.

? *a–c.* Young. Sign. From the Milan Museum as *Leuciscus illyricus.*

23. Leuciscus spurius.

Squalius spurius, *Heckel, in Russegger's Reisen,* i. p. 1081, and ii. 3. p. 227, tab. 16. fig. 3.

D. 11. A. 13. L. lat. 50. L. transv. 10/?.

The height of the body is about two-ninths of the total length (without caudal). The diameter of the eye is rather more than one-half of the width of the interorbital space, and two-ninths of the length of the head. Mouth of moderate width, not extending to the vertical from the front margin of the eye, with the jaws even in front. *The origin of the anal fin is below the last dorsal ray.* Coloration uniform. (*Heck.*)

Aleppo. Five inches long.

24. Leuciscus idus.

Der Gängling, Aland, or Nerfling. Id (Sweden).

Capito fluviatilis (Jeses), *Gesner, Paral. C.* p. 9; *Hist. Anim.* p. 1266; *Aldrovand.* p. 603; *Schwenckfeld, Theriotr.* p. 423; *Willughby,* p. 256; *Marsil. Danub. Pan.-Mys.* p. 53, tab. 18. fig. 1.

Cyprinus, sp., *Artedi, Gen.* p. 5. no. 14; *Spec.* p. 6. no. 1; *Synon.* p. 14. no. 30, and p. 7. no. 11; *Gronov. Zoophyl.* no. 346.

Leuciscus, no. 13, *Klein, Pisc. Miss.* v. p. 68.

Cyprinus idus, *L. Syst. Nat.* p. 529; *Pallas, Zoogr. Ross.-As.* p. 316; *Ekström, Fische v. Mörkö,* p. 5, tab. 1; *Fries & Ekström, Skand. Fisk.* p. 59, tab. 11; *Gronov. Syst.* ed. *Gray,* p. 180.

—— jeses, *L. Syst. Nat.* i. p. 530; *Bloch, Fische Deutschl.* i. p. 45, taf. 6; *Meidinger,* fig. 42; *Perty, in Oken's Isis,* 1832, p. 719.

—— idbarus, (? *L. Syst. Nat.* i. p. 529) *Meidinger,* fig. 41.

—— microlepidotus, *Ekström, Fische v. Mörko,* p. 18, tab. 2.

Leuciscus idus, *Sélys-Longch. Faune Belge,* p. 209; *Yarrell, Brit. Fish.*

2nd edit. . p. 395; 3rd edit. i. p. 418; *Kröyer, Danm. Fisk.* iii. p. 447; *Nilss. Skand. Faun.* iv. p. 306; *Cuv. & Val.* xvii. p. 228.
Leuciscus neglectus, *Sélys-Longch. l. c.*
—— cephalus, *Yarr. Brit. Fish.* 2nd edit. i. p. 409 (figure, not text).
—— jeses, *Cuv. & Val.* xvii. p. 160.
Idus melanotus, *Heckel, Sitzgsber. Ak. Wiss. Wien*, ix. 1852, p. 49; *Heckel & Kner, Süsswasserf.* p. 147. figs. 77 & 78; *Dybowski, Cyprin. Livlands*, p. 141; *Siebold, Süsswasserf.* p. 176; *Jeitteles, Fische d. March*, ii. 1864, p. 11; *Malmgren, Wiegm. Arch.* xxx. p. 316; *Blanchard, Poiss. France*, p. 389.

Variety.

The Golden Ide. Der Goldnerfling.
Capito fluviatilis (Orfus), *Gesner, Paralip.* p. 10; *Hist. Anim.* p. 1268; *Aldrovand.* p. 605.
Orfus ruber, *Willughby*, p. 253, taf. 2. fig. 1.
Cyprinus, sp., *Artedi, Synon.* p. 6. no. 8; *Gronov. Zoophyl.* no. 340.
Leuciscus, sp., *Klein, Pisc. Miss.* iv. p. 65, taf. 15.
Cyprinus orfus, *L. Syst. Nat.* i. p. 530; *Bl. Fische Deutschl.* iii. p. 138, taf. 98; *Meidinger*, no. 28; *Gronov. Syst.* ed. *Gray*, p. 180.
Rothe Orfe, *J. D. Meyer, Angenehmer und nützlicher Zeitvertreib, Nürnberg*, 1748, i. p. 31, tab. 43.
Leuciscus orfus, *Cuv. & Val.* xvii. p. 224.
Idus melanotus, var., *Heckel & Kner, Süsswasserf.* p. 150; *Siebold, Süsswasserf.* p. 177.
Idus miniatus, *Heckel & Kner, l. c.* p. 151.

D. 11–12. A. 13–14. V. 10. L. lat. 56–59. L. transv. $\frac{9\text{-}10}{7}$.
Vert. 26/21.

Body very slightly elevated, its depth being two-sevenths of the total length (without caudal). Mouth of moderate width, terminal; jaws even in front. Origin of the dorsal fin above the root of the ventral. There are four and a half longitudinal series of scales between the lateral line and ventral fin. Coloration uniform.

Central and northern parts of continental Europe.

Pharyngeal teeth 5 . 3—3 . 5, not serrated, hooked.

a, b. Adult and young. Lake Wenern. From Mr. Lloyd's Collection.
c. Adult and young. Gefle (Sweden). From Mr. Wheelwright's Collection.
d–e. Adult. Danube. From the Stuttgart Collection.
f–g. Young. Upper Austria.
h–k. Adult: skeletons. Purchased of Mr. Damon.
l. Adult: skull. Danube. From Dr. A. Günther's Collection.

Variety *orfus*. Uniform orange-coloured; semidomesticated.

a. Fine specimen. Dinkelsbühl (Bavaria). Presented by Prof. v. Siebold.

Variety *lapponicus*. The height of the body is not much less than one-third of the total length (without caudal). The origin of the dorsal fin is nearly in the same vertical with that of the ventral.

a–b, c–f. Seven and eight inches long. Munio River. Purchased of Mr. Stevens.

25. Leuciscus borysthenicus.

Squalius borysthenicus, *Kessler, Bull. Soc. Nat. Mosc.* 1859, xxxii. 1. p. 545.

D. 11. A. 11–12. V. 9. L. lat. 37–38. L. transv. 7/?.

The height of the body is one-fourth or two-ninths of the total length (with the caudal), the length of the head one-fifth. Head broad; mouth very oblique. There are two and a half longitudinal series of scales between the lateral line and the root of the ventral fin. "The dorsal fin commences immediately behind the ventrals." The pectoral fins terminate at a great distance from the ventrals. Coloration uniform. (*Kessler.*)

Dnjepr, near Aleschki.

26. Leuciscus erythrophthalmus.

The Rudd, or Red-eye. Das Rothauge. Sarf (Swed.). Le Rotengle. Scardola (Italy).
Leuciscus rubellio, *Schwenckfeld.*
Rubellus, *Marsil. Danub. Pann.-Mys.* iv. p. 41, tab. 13. fig. 4.
Erythrophthalmus, *Willughby*, iv. p. 249, tab. Q. 3. fig. 1; *Ray, Synops.* p. 16.
Cyprinus, sp., *Artedi, Genera*, p. 3. no. 2; *Spec.* p. 9. no. 2; *Synon.* p. 4. no. 3; *Gronov. Zoophyl.* i. p. 107. no. 340.
Cyprinus erythrophthalmus, *L. Syst. Nat.* i. p. 530; *Leske, Ichth. Lips.* p. 60; *Bl. Fische Deutschl.* i. p. 28, tab. 1; *Bl. Schn.* p. 434; *Lacép.* v. p. 577; *Ascan. Icon.* tab. 42; *Osbeck, Vet. Ak. Handl.* 1771, p. 152, tab. 4. fig. 4; *Meidinger*, tab. 24; *Donovan, Brit. Fish.* ii. pl. 40; *Turton, Brit. Faun.* p. 108; *Agass. Mém. Soc. Sc. Nat. Neuchâtel*, p. 38; *Jenyns, Manual*, p. 412; *Ekström, Fische v. Mörkö*, p. 21; *Fries och Ekstr. Skand. Fisk.* p. 74, tab. 17; *Gronov. Syst.* ed. *Gray*, p. 183.
Rud, *Penn. Brit. Zool.* iii. p. 318, pl. 72, or, edit. 1812, iii. p. 479, pl. 83; *Couch, Fish. Brit. Isl.* iv. p. 49, pl. 192.
Cyprinus erythrops, *Pall. Zoogr. Ross.-As.* iii. p. 317.
—— compressus, *Holberg, Götheb. N. Handl.* v. p. 66, c. fig.
Leuciscus erythrophthalmus, *Fleming, Brit. An.* p. 188; *Sélys-Longch. Faun. Belg.* p. 213; *Cuv. & Val.* xvii. p. 107; *Nilss. Skand. Faun. Fisk.* p. 313; *Thompson, Nat. Hist. Ireland*, p. 138; *Nordmann, in Demid. Voy. Russ. Mérid.* iii. p. 490; *Kröyer, Danm. Fisk.* iii. p. 421; *Günther, Fische d. Neckars*, p. 80; *Rapp, Fische d. Bodensee's*, p. 8.
Rotengle, *Jurine, Poiss. du Lac Léman*, p. 209, tab. 12.
Red-eye, *Yarrell, Brit. Fish.* i. p. 361; 2nd edit. i. p. 412; 3rd edit. i. p. 411.
Azurine, *Yarrell, Brit. Fish.* i. p. 365; 2nd edit. i. p. 416; 3rd edit. i. p. 415.
Cyprinus cæruleus, *Jenyns, Man.* p. 413.
Leuciscus cæruleus, *Yarrell, Trans. Linn. Soc.* xvii. p. 8, pl. 2. fig. 2.
—— rubilio, *Bonap. Faun. Ital. Pesc.* (from a deteriorated individual).
Scardinius erythrophthalmus, *Bonap. Faun. Ital. Pesc.*; *Heckel & Kner, Süsswasserf.* p. 153. figs. 79, 80; *Dybowski, Cyprin. Livlands*, p. 134; *Siebold, Süsswasserf.* p. 180; *Malmgren, Wiegm. Arch.* xxx. p. 317; *Jeitteles, Fische d. March*, ii. 1864, p. 12; *Canestrini, Arch. p. la Zoolog. etc.* iii. p. 106; iv. p. 89; *Blanchard, Poiss. France*, p. 377.
—— scardafa, *Bonap. l. c.*; *Heckel & Kner, l. c.* p. 157. fig. 82; *Cuv. & Val.* xvii. p. 123.

Leuciscus apollonitis, *Richards. Proc. Zool. Soc.* 1856, p. 374.
Scardinius macrophthalmus, *Heckel & Kner, Süsswasserf.* p. 160. fig. 85.
—— dergle, *Heckel & Kner, l. c.* p. 156. fig. 81.
—— plotizza, *Heckel & Kner, l. c.* p. 159. fig. 84.
—— hesperidicus, *Nardo, Prosp. Sist.* pp. 72, 91.

D. 11–12. A. 13–15. V. 9–10. L. lat. 39–42. L. transv. $\frac{7\frac{1}{2}}{5\frac{1}{2}}$. Vert. 21/18, 23/16.

Body elevated, its depth being generally more than one-third of the total length (without caudal). Mouth terminal, narrow, very oblique; jaws even in front. There are three longitudinal series of scales between the lateral line and ventral fin. Origin of the dorsal fin conspicuously behind the root of the ventral. Belly behind the ventrals compressed into an edge, covered by the scales extending across it. Fins generally red, especially the lower.

Pharyngeal teeth distinctly serrated, 4 or 5 . 2 or 3—3 . 5.

Europe; Asia Minor.

a–b. Fine specimens. Gefle, Sweden. Collected by Mr. Wheelwright.
c. Adult. Lake Wenern. Collected by Mr. Lloyd.
d. Half-grown: stuffed. Loch Maben, Scotland. Purchased of Mr. Parnell.
e. Young. Liverpool. Presented by Mr. Yarrell.
f–i. Adult and young: stuffed and skins. British.
k. Adult. River Lea, Essex. Presented by J. Doubleday, Esq.
l. Adult.
m. Adult. Holland. From Dr. Bleeker's Collection.
n. Adult: skin. Holland. From Gronow's Collection.
o. Fine specimen. Neckar. From the Stuttgart Collection.
p–q. Fine specimens. Danube. From the Stuttgart Collection.
r–s, *t–x*. Fine specimens. Bavaria. From Dr. Gemminger's Collection.
y. Fine specimen. Achensee, Bavaria. Presented by Prof. v. Siebold.—Var. *hesperidica*; lower fins blackish.
z. Half-grown. Switzerland. Presented by Professor L. Agassiz.
α. Half-grown. Italy.—(*L. scardafa.*)
β. Adult: skin. Lago Maggiore. Presented by T. C. Eyton, Esq.
γ. Half-grown, not in good state. River Kuin (Dalmatia). From the Milan Museum as *Leuciscus dergle.*
δ. Half-grown. River Rieka (Montenegro). From the Milan Museum as *Leuciscus scardafa.*
ε. Young. Lake Apollonia, Bithynia. Presented by H. Poole, Esq. Type of *Leuciscus apollonitis.*
ζ. Adult: skeleton. Holland. Purchased of Mr. Damon.
η. Adult: skeleton. England. Purchased.

Leuciscus marrochius, Costa, Fauna Neapol. Pisc. p. 12, pl. 13: Cuv. & Val. xvii. p. 125, from the vicinity of Turin; *Leuciscus lascha* Costa, *l. c.* p. 19, tab. 16; Cuv. & Val. xvii. p. 127; and *Leuciscus scarpetta*, Cuv. & Val. xvii. p. 126, from Trasimeno, are, if not identical with *L. erythrophthalmus*, at all events very closely allied to it. The most recent investigator of the Italian freshwater-fish-fauna, Canestrini (*l. c.* p. 93), doubts their specific validity.

Hybrid between Leuciscus erythrophthalmus and Leuciscus rutilus. See p. 214.

Hybrid between Leuciscus erythrophthalmus and Abramis blicca.

Bliccopsis abramo-rutilus (part.), *Siebold, Süsswasserf.* p. 142.
Brama isognathus, *Bleek. Versl. Med. Akad. Wet. Natuurk.* xv. p. 235; or *Nederl. Tydschr. Dierk.* i. 1863, p. 371.
Bliccopsis erythrophthalmoides, *Jäckel, Abhandl. zool.-mineral. Ver. Regensb.* 1864, p. 49, and 1865, p. 38.

This form is similar to the hybrid between Roach and Bream (see p. 214), but deeper in the body and with larger scales.

The pharyngeal teeth are placed in a double series, the inner series being composed of two, rarely three, teeth.

Anal fin with 14–18 rays. Back of the trunk not compressed into an edge; belly behind the ventrals compressed into an edge, the scales not extending across it. Snout short, obtuse; mouth terminal, with the jaws even. The height of the body is contained twice and one-third, or, in young examples, twice and two-thirds in the total length (without caudal). L. lat. 42–44. L. transv. 8–9/7. Four and a half longitudinal series of scales between the lateral line and ventral fin.

These hybrids have been observed in Holland and Germany.

a. Eight inches long. Rhine. From Dr. Bleeker's Collection.—Type of *Brama isognathus*.
b. Five inches long. Danube. Presented by Prof. v. Siebold.

Hybrid between Leuciscus erythrophthalmus and Alburnus lucidus.

A. J. Jäckel describes a fish from the river Altmühl in Bavaria which he regards as a hybrid between these two species, and names *Alburnus rosenhaueri*. Zoolog. Garten Frankf. 1866, p. 20.

27. Leuciscus heegeri.

Leuciscus heegeri, *Agass. Mém. Soc. Hist. Nat. Neuchâtel*, i. p. 38.
Leuciscus (Scardinius) heegeri, *Bonap. Faun. Ital. Pesc.*
Leuciscus hegeri, *Cuv. & Val.* xvii. p. 236.

D. 10. A. 11. L. lat. 60. L. transv. 9/?.

The height of the body equals the length of the head, and is one-fourth of the total (without caudal). Mouth terminal, obliquely ascending forwards. There are five and a half longitudinal series of scales between the lateral line and ventral fin. The origin of the dorsal fin is above the root of the inner ventral ray. Coloration uniform.

Pharyngeal teeth serrated, in two series.

Istria.

28. Leuciscus muticellus.

Ryserle, *Gesner, Hist. Anim.* iv. p. 497.
Grislagine, *Willughby, Hist. Pisc.* p. 263, tab. Q. 1. fig. 1.
Cyprinus aphya, *Hartmann, Helvet. Ichth.* p. 200; *Agassiz in Isis,* 1828, p. 1048.
Leuciscus aphya, *Agassiz, in Wiegm. Arch.* 1838, p. 79.
—— muticellus, *Bonap. Faun. Ital. Pesc.*; *De Filippi, Cenni Pesc. Lombard.* p. 13; *Günth. Fische d. Neck.* p. 57, c. tab.
—— savignyi, *Bonap. l. c.*; *Cuv. & Val.* xvii. p. 238, pl. 494.
—— genei, *Bonap. l. c.*; ? *Cuv. & Val.* xvii. p. 159*.
—— comes, *Costa, Faun. Nap. Pesc.* p. 26, tav. 18 bis.
—— agassizii, *Cuv. & Val.* xvii. p. 254, pl. 495 (descript. erroneous).
Telestes agassizii, *Heckel, Sitzgsber. Ak. Wiss. Wien,* 1851, viii. p. 386; *Heck. & Kner, Süsswasserf.* p. 206. fig. 116; *Siebold, Süsswasserf.* p. 212.
—— rysela, *Heckel, Sitzgsber. Ak. Wiss. Wien,* 1852, ix. p. 100.
—— savignyi, *Heck. & Kner, Süsswasserf.* p. 208. fig. 117; *Martens, Wiegm. Arch.* 1857, p. 182.
—— muticellus, *Canestrini, Arch. p. la Zool. etc.* iii. 1864, p. 108, and iv. 1866, p. 113.
Squalius agassizii, *Blanchard, Poiss. France,* p. 406 (fig. not good).

D. 10–11. A. (10) 11–12 (13). V. 9–10. L. lat. 46–60.
L. transv. $\frac{9-10}{5-6}$. Vert. $\frac{20-21}{19-21}$.

Body rather elongate, its depth being two-ninths or one-fourth of the total length (without caudal). The width of the interorbital space is more than the diameter of the eye, and scarcely more than one-third of the length of the head. The cleft of the mouth does not quite reach the vertical from the front margin of the eye. Snout more or less convex, the upper jaw overlapping the lower. Origin of the dorsal fin opposite to the root of the inner ventral ray. The anal fin commences at some distance behind the vertical from the last dorsal ray. There are four and a half longitudinal series of scales between the lateral line and ventral fin. A more or less distinct dark band along the side of the head and body, above the lateral line.

Pharyngeal teeth 5 . 2—2 . 4, hooked, slightly denticulated.

Italy; Switzerland; tributaries of the upper Danube and Rhine.

a, b–f. Adult and young. River Isar (Bavaria). Presented by Prof. v. Siebold.
g. Adult: skeleton. Neckar. From Dr. A. Günther's Collection.
h. Adult: skull. Neckar. From Dr. A. Günther's Collection.

Cyprinus chrysoprasius, Pall. Zoogr. Ross.-As. iii. p. 318, is a fish from the Crimea, evidently closely allied to, if not identical with, *L. muticellus.* Pallas notices the small scales, the oblong shape, the lateral bands, the orange-coloured base of the paired fins, the occurrence in rapid streams,—which characters indicate at once the nature of the fish described by Pallas. Heckel and Bleeker, guided by the accidental circumstance that the anal is said to be 23-rayed, referred the fish to *Abramis*. However, this number is evidently a misprint for 13, inasmuch as Pallas enumerates, in his section *d*, first the species with short anal fin (and among them is *C. chrysoprasius*), then those with that fin elongate, and finally those with very long anal.—Some other authors have referred this *C. chrysoprasius* to *Leuciscus phoxinus*.

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* I think there can be but little doubt as regards the identity of the fish figured by Bonaparte as *L. genei* with his *muticellus.* However, Valenciennes states that the specimens examined by him have only one series of pharyngeal teeth; whether this statement is erroneous or taken from specimens which are not Bonaparte's *L. genei,* cannot be determined without reexamination of the examples in the Paris Museum.

Hybrid between Leuciscus muticellus and Chondrostoma nasus.

Chondrostoma rysela, Agassiz, Mém. Soc. Sc. Nat. Neuchâtel, i. 1835, p. 38; or Wiegm. Arch. 1838, p. 80; Heckel, Sitzgsber. Akad. Wiss. Wien, ix. 1852, p. 377, taf. 8; Heckel & Kner, Süsswasserf. p. 220 (*Chondrostoma genei*, part.); Siebold, Süsswasserf. p. 232. fig. 42, is, according to the researches of Siebold, a hybrid between *Chondrostoma nasus* and *Leuciscus muticellus*. Externally it resembles sometimes more the former, at other times the latter. The cleft of the mouth is always more arched than in *Ch. nasus*.—Pharyngeals generally 5 . 6, sometimes with an additional odd tooth in a separate series. The pharyngeal bones have generally a shallow notch on their extero-anterior margin. D. 11–12. A. 12–13. L. lat. 50–60. L. transv. $\frac{8-9}{3-6}$.

29. Leuciscus ukliva.

Squalius ukliva, *Heckel, in Russegger's Reisen*, i. p. 1042; *Heck. & Kner, Süsswasserf.* p. 199. fig. 112.

D. 10–11. A. 11–12. L. lat. 62–65. L. transv. 11/9.

The height of the body is rather more than one-fourth of the total length (without caudal). The width of the interorbital space is more than the diameter of the eye, and about one-third of the length of the head. The cleft of the mouth does not quite reach the vertical from the front margin of the eye. Snout convex, the upper jaw overlapping the lower. Origin of the dorsal fin opposite to the middle of the base of the ventral. There are five longitudinal series of scales between the lateral line and ventral fin. A more or less distinct dark band along the side of the head and body, above the lateral line; base of all the fins orange-coloured. Pharyngeal teeth 5 . 2—2 . 4 or 5?.

River Cettina (Dalmatia).

a–b. Adult. River Cettina. From the Milan Museum.

The following example is evidently a *hybrid* between *L. ukliva* and *Alburnus alburnellus*. It has A. 16 and L. lat. 44, but the scales are striated, and there is a dark band along the side; base of the fins orange-coloured.

a. Four inches long. River Narenta. From the Milan Museum.

30. Leuciscus turskyi.

Squalius turskyi, *Heckel, in Russegger's Reisen,* i. p. 1041; *Heck. & Kner, Süsswasserf.* p. 201. fig. 113.

D. 10. A. 11. L. lat. 70–72. L. transv. 15/?.

The height of the body is rather more than one-fifth of the total length (without caudal). The width of the interorbital space is more than the diameter of the eye, and about one-third of the length of the head. The cleft of the mouth does not reach the vertical from the front margin of the eye. Snout scarcely convex, the upper jaw but slightly overlapping the lower. Origin of the dorsal fin opposite to the root of the inner ventral ray. There are five or six longitudinal series of scales between the lateral line and ventral fin. A dark band along the side of the head and body, above the lateral line. Fins orange-coloured at the base. (*Heck.*)

Dalmatia.

Squalius microlepis, Heckel, *l. c.* p. 1042; Heck. & Kner, *l. c.* p. 202. fig. 114, from the same country, is probably not specifically distinct from *L. turskyi*, and founded on examples without the lateral band, which also in *L. muticellus* so frequently disappears.

Prof. Canestrini (Arch. p. la Zool. etc. iv. 1866, p. 111) regards *S. ukliva, microlepis, turskyi,* and *tenellus* as being one and the same species.

31. Leuciscus tenellus.

Squalius tenellus, *Heckel, in Russegger's Reisen,* i. p. 1042; *Heck. & Kner, Süsswasserf.* p. 204. fig. 115.

D. 10–11. A. 11. L. lat. 78–80. L. transv. 18/?.

The height of the body is rather more than one-fifth of the total length (without caudal). The width of the interorbital space is more than the diameter of the eye, and a little less than one-third of the length of the head (namely, the diameter of the eye equals two-thirds of the interorbital space, or equals one-fifth or two-elevenths of the length of the head). The cleft of the mouth does not quite reach the vertical from the front margin of the eye. Snout not convex, the upper jaw scarcely longer than the lower. Origin of the dorsal fin opposite to the root of the inner ventral ray. There are eight longitudinal series of scales between the lateral line and ventral fin. Coloration uniform, bluish grey. (*Heck.*)

Livno (Bosnia).

32. Leuciscus vanensis.

D. 11. A. 12. L. lat. 69. L. transv. 12/8.

The height of the body is a little more than one-fifth of the total length (without caudal), the length of the head nearly one-fourth. The diameter of the eye is two-ninths of the length of the head, equal to that of the snout, and three-fourths of the width of the interorbital space. Cleft of the mouth very oblique, not reaching to the vertical from the front margin of the orbit; lower jaw slightly overlapped by the upper, but projecting beyond it when the mouth is open. Origin of the dorsal fin behind the root of the ventrals, and considerably nearer to the base of the caudal than to the end of the snout. Pectoral fin terminating at a great distance from the ventral. Scales with numerous conspicuous striæ. There are four longitudinal series of scales between the lateral line and ventral fin. Operculum but little higher than long; suborbital ring nearly as broad as the soft part of the cheek beneath it A dark band along each side of the body.

Erzeroum.

a. Six inches long. Lake Van. Presented by Dr. A. Günther.

This species belongs to the division which has been named *Telestes*.

33. **Leuciscus polylepis.**

Telestes polylepis, *Steindachner, in Sitzgsber. Ak. Wiss. Wien*, liv. 1866, p. 300 (with a plate).

D. 10. A. 11. L. lat. 68–71. L. transv. 12–13/?.

The height of the body is one-fourth or rather less than one-fourth of the total length (without caudal). The diameter of the eye is two-sevenths or one-fourth of the length of the head. The cleft of the mouth does not reach the vertical from the front margin of the eye. Snout convex, the upper jaw overlapping the lower. Origin of the dorsal fin opposite to the root of the inner ventral ray. There are five or six longitudinal series of scales between the lateral line and ventral fin. A dark band along the side of the head and body, above the lateral line. Fins orange-coloured at the base. (*Steindachner.*)

Pharyngeal teeth 5 . 2—2 . 4.

Croatia.

2. *Lateral line incomplete*: Phoxinus.

34. **Leuciscus phoxinus.**

The Minnow. Die Pfelle, Pfrille, or Elritze. Véron.

Phoxinus, *Belon. De Aquat.* p. 322 (not *Rondel.*).

Phoxinus belonii, *Aldrov.* p. 582.

Minow, *Willughby*, p. 268, tab. Q. 8. fig 7; *Pennant, Brit. Zool.* iii. p. 326, or, edit. 1812, iii. p. 489; *Couch, Brit. Fish.* iv. p. 64, pl. 199.

Cobitis fluviatilis, *Marsil. Danub.* iv. tab. 9. fig. 1.

Cyprinus, sp., *Artedi, Gen.* p. 4. no. 9; *Synon.* p. 12. nos. 22 & 23, p. 13. no. 29; and *Spec.* p. 30. no. 16.

Cyprinus phoxinus, *L. Syst. Nat.* p. 528; *Bl. Fische Deutschl.* p. 60, tab. 8. fig. 5; *Bl. Schn.* p. 437; *Lacép.* v. p. 571; *Meidinger*, tab. 39; *Jurine, Poiss. Lac Léman*, p. 229, pl. 14; *Donovan, Brit. Fish.* iii. pl. 60; *Turton, Brit. Faun.* p. 109; *Jenyns, Manual*, p. 415; *Ekström, Fische von Mörkö*, p. 26; *Gronov. Syst.* ed. *Gray*, p. 185.

Cyprinus aphya, *L. Syst. Nat.* p. 528; *Meidinger*, tab. 15.

—— morella, *Leske, Ichthyol. Lips.* p. 47.

Veron, *Duhamel, Pêches*, ii. p. 515, pl. 26. fig. 7.

Cyprinus rivularis, *Pallas, Zoogr. Ross.-Asiat.* iii. p. 330; *Kessler, Bull. Soc. Nat. Mosc.* 1859, xxxii. 2. p. 540.

Leuciscus phoxinus, *Fleming, Brit. An.* p. 188; *Nilsson, Skand. Faun.* iv. p. 319; *Ci & Val.* xvii. p. 363; *Yarrell, Brit. Fish.* i. p. 372, or 2nd edit. i. p. 423, or 3rd edit. i. p. 442; *Parnell, Werner. Mem.* vii. p. 268; *Thompson, Nat. Hist. Ireland,* iv. p. 138; *Günther, Fische d. Neckars,* p. 53.

Phoxinus lævis, *Agassiz, Mém. Soc. Sc. Nat. Neuchâtel,* i. p. 37; *Sélys-Longch. Faun. Belge,* p. 203; *Rapp, Fische d. Bodensee's,* p. 10; *Heckel & Kner, Süsswasserf.* p. 210. figs. 119 & 120; *Kessler, Bull. Soc. Nat. Mosc.* 1859, xxxii. 2. p. 539; *Dybowski, Cyprin. Livlands,* p. 105; *Siebold, Süsswasserf.* p. 222; *Malmgren, Wiegm. Arch.* xxx. p. 320; *Canestrini, Arch. per la Zool.* iv. 1866, p. 118.

Phoxinus marsilii, *Heckel, Ann. Wien. Mus.* i. p. 232; *Nordmann, in Demid. Voy. Russ. Mérid.* iii. p. 482; ? *De Filippi, Viagg. in Persia,* p. 359.

—— chrysoprasius, *Nordmann, l. c.* p. 483.

—— aphya, *Kröyer, Danm. Fisk.* iii. p. 524.

—— lævis, var. chrysoprasius, *Jeitteles, Verhandl. zool.-bot. Gesellsch. Wien,* 1862, p. 304, tab. 11. fig. 2.

D. 10. A. 9–10. V. 9–10. L. lat. 80–90. L. transv. 15/14. Vert. 21/19.

Dorsal fin opposite to the space between ventrals and anal. Mouth anterior. Upper jaw slightly overlapping the lower; body subcylindrical. A blackish spot at the base of the caudal (which is forked); a more or less distinct series of blackish spots along the side of the body, the spots sometimes confluent into a band.

Pharyngeal teeth uncinate, 5 or 4 . 2—2 . 4 or 5. Gill-rakers very short and few in number; pseudobranchiæ.

Europe.

a, b–c. Adult. England.
d. Half-grown. North of England. Museum Leach.—*Skiddaw.*
e–k. Large specimens. Llyn Benguilin, Wales. Presented by Dr. A. Günther.
l–n. Adult. Norway. Presented by P. S. Godman, Esq.
o. Many specimens. Lake Wenern. From Mr. Lloyd's Collection.
p, q. Adult. River Main. Presented by Dr. A. Günther.
r–u. Adult. Rhine, at Strasbourg. Presented by Prof. von Siebold.
v. Several adult specimens. Waiblingen, Würtemberg. From the Stuttgart Collection.
w–y. Adult. Danube. Purchased of Dr. J. Heckel.
z–δ. Adult. Frankstadt, in Moravia. From Hr. Jeitteles's Collection.
ε. Adult: skin. Holland. From Gronow's Collection.
ζ. Adult: skeleton. Neckar. From Dr. A. Günther's Collection.

35. Leuciscus hispanicus.

Phoxinus hispanicus, *Steindachner, Sitzgsber. Ak. Wiss. Wien,* 1866, liv. p. 268, taf 1. fig. 1.

D. 10. A. 11. V. 9. L. lat. 62–65.

Dorsal fin opposite to the space between ventrals and anal. Cleft of the mouth very oblique, the lower jaw not overlapped by the upper. Body subcylindrical. Lateral line more or less incomplete. Caudal fin deeply forked. A blackish band along the side of the body. (*Steind.*)

Rivulets near Merida (Spain).

II. *American Species.*

A. *More than fifty scales in the lateral line.*

1. *The dorsal fin commences above, or but little in advance of, the root of the ventrals.*

a. *Pharyngeal teeth in two series.*

36. Leuciscus grandis.

Gila grandis, *Ayres, Proc. Calif. Acad. Nat. Sc.* 1854, p. 18.
? Ptychocheilus major, *Agass. Sillim. Journ*, 1855, xix. p. 229 (without specific description).
—— grandis, *Girard, U. S. & Pac. R. R. Exped. Fish.* p. 299.
? Ptychocheilus rapax, *Girard, Proc. Acad. Nat. Sc. Philad.* 1856, p. 209; and *U. S. & Pac. R. R. Exped. Fish.* p. 300, pl. 65.
Ptychocheilus lucius, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 209; and *U. S. & Mex. Bound. Ichthyol.* p. 65, pl. 34. figs. 1–4.

D. 10. A. 11. V. 10. L. lat. 78–92. L. transv. $\frac{16-13}{16-13}$.

Head and body low and elongate; the height of the body is contained five times and a half in the total length (without caudal), the length of the head thrice and two-thirds. Head at least twice as long as deep, the width of the interorbital space (which is slightly convex) being less than the length of the snout. *Eye small*, its diameter being one-third of the length of the snout, and two-ninths of that of the postorbital part of the head. Mouth subhorizontal, large, the maxillary extending to behind the vertical from the front margin of the eye. Jaws even in front. Lips well developed. Suborbital bones narrow, the præorbital being much longer than the eye and nearly twice as large as the postorbital. The origin of the dorsal fin is opposite to the middle of the root of the ventral fin, and midway between the præoperculum and base of the caudal. Caudal fin forked. There are eight or ten longitudinal series of scales between the lateral line and ventral fin. Coloration uniform.

Pharyngeal bones slender, narrow, with two series of subconical teeth, pointed and slightly hooked at the extremity, 4 . 2—2 . 4. Gill-rakers very short, few in number. The attachment of the gill-membrane to the isthmus takes place somewhat in advance of the posterior præopercular margin.

California.

a–b. Fourteen inches long. San Francisco. Presented by Dr. W. O. Ayres.

37 Luciscus oregonensis.

Cyprinus (Leuciscus) oregonensis, *Richards. Faun. Bor.-Amer. Pisc.* p. 305.
? Ptychocheilus gracilis, *Agassiz, in Sillim. Journ.* 1855, xix. p. 229 (without specific description).
Ptychocheilus oregonensis, *Girard, in U. S. & Pac. R. R. Exped. Fish.* p. 298, pl. 64. figs. 5–9.

D. 10. A. 10. V. 9. L. lat. 73. L. transv. 14/14.

Head and body low and elongate; the height of the body is contained five times in the total length (without caudal), the length of the head thrice and three-fourths. Head not quite twice as long as deep, the width of the interorbital space (which is flat) being equal to the length of the snout. *Eye of moderate size*, its diameter being one-half of the length of the snout, and one-third of that of the postorbital part of the head. Mouth subhorizontal, large, the maxillary extending to behind the vertical from the front margin of the eye. Jaws nearly even in front. Lips well developed. Suborbital bones narrow, the præorbital being longer than the eye and nearly twice as large as the postorbital. The origin of the dorsal fin is nearly opposite to the middle of the root of the ventral fin and somewhat nearer to the præoperculum than to the base of the caudal. Caudal fin forked. There are eight longitudinal series of scales between the lateral line and ventral fin. Coloration uniform.

Pharyngeal bones narrow, but stoutly built, with two series of subconical teeth, pointed, and slightly hooked at the extremity, 5 . 2—2 . 5. Gill-rakers very short, few in number. The attachment of the gill-membrane to the isthmus takes place opposite to the hind margin of the præoperculum.

Oregon.

a. Type of the species, 13 inches long. Oregon. From the Haslar Collection.

b. Young. Fraser's River. Voyage of H.M.S. 'Plumper.'

Ptychocheilus vorax, Girard, Proc. Ac. Nat. Sc. Philad. 1856, p. 209, and U. S. & Pac. R. R. Exped. Fish. p. 301, appears to belong to the same group as *L. grandis* and *L. oregonensis*; it is described thus:—The greatest depth of the body is nearly equal to the length of the head, which is nearly one-fifth of the total (with the caudal). Peduncle of the tail very slender. The diameter of the eye is two-thirteenths of the length of the head. The maxillary extends to the vertical from the front margin of the eye. Origin of the dorsal somewhat nearer to the root of the caudal than to the end of the snout.

38. **Leuciscus gracilis.**

Cyprinus (Leuciscus) gracilis, *Richardson, Faun. Bor.-Amer. Pisc.* p. 120, pl. 78.

D. 9. A. 10. V. 8. L. lat. 55. L. transv. 7/9.

The height of the body is about equal to the length of the head, which is contained four times and three-fourths in the total (without caudal). Crown of the head broad and flat; nape gibbous. The diameter of the eye is one-half of the length of the snout, and one-third of that of the postorbital portion of the head. Upper jaw overlapping the lower; mouth subhorizontal. The origin of the dorsal fin is opposite to that of the ventrals and somewhat nearer to the end of the snout than to the root of the caudal fin, which is deeply forked. Coloration uniform. (*Rich.*)

Saskatchewan River. Length 12 inches.

The pharyngeal teeth of this fish are not known, but it appears to be closely allied to the species which have been named *Ptychocheilus* and *Gila*.

39. Leuciscus robustus.

Gila robusta, *Baird & Girard, Proc. Ac. Nat. Sc. Philad.* 1853, p. 368; and in *Sitgreaves, Rep. Zuñi and Colorado Riv.* p. 148, *Fish.* pl. 1; or in *U. S. & Pac. R. R. Exped. Fish.* p. 285.

D. 1/9. A. 1/9. V. 10.

Scales very small. The upper profile of the head is concave, the back being elevated and the snout produced and depressed; the free portion of the tail low and elongate, its depth being about one-third of its length. Mouth large, the intermaxillary extending beyond the vertical from the front margin of the orbit; upper jaw overlapping the lower. Eye small, one-eighth of the length of the head, and about two-fifths of that of the snout. Interorbital space very broad. The origin of the dorsal fin is nearer to the root of the caudal than to the end of the snout, and opposite to the base of the inner ventral rays. Caudal fin forked. Pectoral fins extending beyond the insertion of the ventrals in the male, and not reaching it in the female. Coloration uniform.

Pharyngeal teeth 5.2—2.4, subcylindrical, hooked, without grinding-surface. (*Girard.*)

Zuñi River. Specimens 13 inches long.

This is probably the type of a distinct genus, which, however, we are unable properly to characterize, being unacquainted with important details of structure.

40. Leuciscus elegans.

Gila elegans, *Baird & Girard, Proc. Ac. Nat. Sc. Philad.* 1853, p. 369; and in *Sitgreaves, l. c.* p. 150, pl. 2; or in *U. S. & Pac. R. R. Exped. Fish.* p. 286; and in *U. S. & Mex. Bound. Ichthyol.* p. 61.

This fish would appear to differ from *L. robustus* in being considerably more elongate, the depth of the free portion of the tail being one-fifth of its length. Also the maxillary is said not to extend to the vertical from the front margin of the orbit.

Zuñi River.

41. Leuciscus zunnensis.

Gila gracilis, *Baird & Girard, Proc. Ac. Nat. Sc. Philad.* 1853, p. 369; and in *Sitgreaves, Rep. Zuñi and Colorado Riv.* p. 151, *Fish.* pl. 3; or in *U. S. & Pac. R. R. Exped. Fish.* p. 287.

D. 3/8. A. 3/8. V. 9.

Scales very small. The upper profile of the head is but slightly concave, the back being scarcely elevated. The length of the head is contained thrice and two-thirds in the total (without caudal), the height of the body four times and one-fourth. Snout of moderate length, not quite twice as long as the eye, which is one-sixth of the length of the head. The free portion of the tail is moderately elongate, about twice as long as deep. Mouth large, oblique, the upper jaw scarcely overlapping the lower; the maxillary extends beyond the vertical from the front margin of the orbit. Interorbital space broad. The origin of the dorsal fin is nearer to the root of the caudal than to the end of the snout; and behind the origin of the ventrals. Caudal fin deeply forked. Pectorals terminating at a great distance from the ventrals. Coloration uniform.

Pharyngeal teeth 5 . 2—2 . 4. (*Girard.*)

Zuñi River. Five and a half inches long.

The following fish appears to be allied to the preceding species, or at least to those which have been named *Gila*. I give the essential characters as far as they have been made known by Pallas:—

Cyprinus leptocephalus.

Pallas, Itin. iii. *Append.* 3. p. 703; *Nov. Act. Petropol.* i. p. 357, tab. 11. fig. 10; *Zoogr. Ross.-As.* iii. p. 312.

D. 9. A. 10.

Scales small. The lateral line runs along the lower part of the body and tail. Dorsal fin opposite to the ventrals. Body oblong. Head with the snout depressed, much produced, the lower jaw projecting beyond the upper; the cleft of the mouth does not extend backwards to below the eye. Barbels none. Gill-openings wide. Abdomen not compressed. Caudal fin deeply forked. All the fins, except the dorsal, reddish, or red.

"In Onone et Ingoda fluviis; magnitudo trispithamalis, imo ulnaris."

42. Leuciscus grahami.

Gila grahami, *Baird & Girard, Proc. Ac. Nat. Sc. Philad.* 1853, p. 389; 1856, p. 205; *U. S. & Mex. Bound. Ichthyol.* p. 61, pl. 24. figs. 7–12.

D. 2/10. A. 2/10.

Scales small. The upper profile of the head is concave, the back being somewhat elevated; snout produced, with the upper jaw a little longer than the lower. Mouth wide, the maxillary reaching to the vertical from the front margin of the eye. The free portion of the tail is low and elongate, its depth being about one-third of its length. The origin of the dorsal fin is a little behind that of the ventrals, and somewhat nearer to the root of the tail than to the end of the snout. Caudal fin forked. Coloration uniform. (*Girard.*)

Rio San Pedro, tributary of Rio Gila.

43. Leuciscus emorii.

Gila emorii, *Baird & Girard, Proc. Ac. Nat. Sc. Philad.* 1853, p. 388; 1856, p. 205; *U. S. & Mex. Bound. Ichthyol.* p. 62, pl. 33. figs. 5–10.

D. 3/9. A. 2/10.

Scales small. Profile of head continuous with that of the body, and gradually tapering from the nape to the snout. Mouth nearly terminal. The maxillary does not reach to the front margin of the orbit. Origin of the dorsal fin nearer to the end of the snout than to the root of the caudal; caudal deeply forked. Coloration uniform. (*Girard.*)

Gila River.

44. Leuciscus crassicauda.

Lavinia crassicauda, *Baird & Girard, Proc. Ac. Nat. Sc. Philad.* 1854, p. 137.

Siboma crassicauda, *Girard, l.c.* 1856, p. 208; *U. S. & Pac. R. R. Exped. Fish.* p. 296, pl. 64. figs. 1–4.

D. 11. A. 9. V. 10. L. lat. 58. L. transv. 10/10.

The height of the body is a little more than the length of the head, which is one-fourth of the total (without caudal); the free portion of the tail is nearly as deep as long. Snout of moderate extent, longer than the eye, the diameter of which is one-sixth of the length of the head. Mouth anterior, subhorizontal, with the jaws nearly even. The maxillary does not reach the vertical from the front margin of the orbit. The postorbital is rather larger than the præorbital, the hinder suborbital being two-thirds as wide as the postorbital. Origin of the dorsal fin considerably nearer to the root of the tail than to the end of the snout, somewhat in advance of the origin of the ventrals. Anal higher than long, caudal slightly emarginate. The pectoral fins terminate at a great distance from the ventrals, which extend to the anal. There are seven longitudinal series of scales between the lateral line and ventral fin. Coloration uniform.

Pharyngeal teeth 5.2—2 or 1.4, compressed, not denticulated, claw-shaped.

California.

a–d. From 7 to 12 inches long. San Francisco. Presented by Dr. W. O. Ayres.

45. Leuciscus cooperi.

Cheonda cooperi, *Girard, Proc. Acad. Nat. Sc. Philad.* 1856, p. 207; *U. S. & Pac. R. R. Exped. Fish.* p. 294, pl. 63. figs. 1–5.

D. 2/9. A. 2/11. V. 10.

Scales of moderate size. The height of the body equals the length of the head, and is one-fourth of the total (without caudal). Upper profile regular. Snout of moderate length, longer than the diameter of the eye, which is two-ninths of the length of the head. The upper jaw slightly overlaps the lower, and the maxillary does not reach to the vertical from the front margin of the orbit. The origin of the dorsal fin is behind that of the ventral, and nearer to the root of the caudal than to the end of the snout. Caudal fin emarginate. Pectorals not extending to the ventrals. Coloration uniform. (*Girard.*)

Pharyngeal teeth compressed, hooked, with a grinding surface, 4.2—2.5.

Columbia River.

b. *Pharyngeal teeth in a single series* (Algansea).

46. Leuciscus tincella.

Leuciscus tincella, *Cuv. & Val.* xvii. p. 323.
Algansea tincella, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 183; and *U. S. & Mex. Bound. Ichthyol.* p. 46, pl. 27. figs. 1–4.

D. 1/9. A. 1/8. L. lat. 70. L. transv. 15/12.

The height of the body is nearly equal to the length of the head, which is one-fourth of the total (without caudal). Snout of moderate extent, longer than the eye. Mouth anterior; slightly oblique, with the jaws nearly even in front; the maxillary does not reach the vertical from the front margin of the orbit. Origin of the dorsal fin midway between the end of the snout and the root of the caudal, opposite to the origin of the ventrals. Anal fin higher than long; caudal emarginate. Coloration uniform.

Pharyngeal teeth 4—4.

Mexico.

47. Leuciscus obesus.

Algansea obesa, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 183; and *U. S. & Pac. R. R. Exped. Fish.* p. 239.

D. 2/9. A. 2/8. V. 9.

Fourteen longitudinal series of scales between the origin of the dorsal fin and the lateral line, and eight between the lateral line and the root of the ventrals. The height of the body is about one-third of the total length (without caudal); the diameter of the eye is nearly one-sixth of the length of the head; the maxillary does not reach the vertical from the front margin of the orbit. The origin of the dorsal fin is nearly opposite to that of the ventrals, and nearer to the root of the caudal than to the end of the snout. Coloration uniform.

Pharyngeal teeth 4 or 5—5 or 4, cultriform. (*Girard.*)

Humboldt River.

48. Leuciscus atrarius.

Siboma atraria, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 208; *U. S. & Pac. R. R. Exped. Fish.* p. 297.
Algansea atraria, *Gill, Proc. Ac. Nat. Sc. Philad.* 1865, p. 70.

D. 2/9. A. 2/8. V. 9.

Eleven longitudinal series of scales above the lateral line, and six between it and the root of the ventrals. The length of the head is a little less than one-fourth of the total (with the caudal); the diameter of the eye is two-elevenths of the length of the head. The maxillary does not reach the vertical from the front margin of the orbit. The origin of the dorsal fin is nearer to the root of the caudal than to the end of the snout, and opposite to the origin of the ventrals. The pectoral fins terminate at a great distance from the ventrals, which do not extend to the vent. Upper parts densely marbled with black. (*Girard.*)

Pharyngeal teeth 5—5.

Utah.

49. Leuciscus formosus.

Algansea formosa, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 183; and *U. S. & Pac. R. R. Exped. Fish.* p. 239.

D. 2/8. A. 2/8.

Ten longitudinal series of scales between the origin of the dorsal fin and the lateral line, and seven between the lateral line and the root of the ventrals. The length of the head is one-fourth of the total (with the caudal), the height of the body one-fifth. The diameter of the eye is one-fifth of the length of the head. The maxillary does not reach the vertical from the front margin of the orbit. The origin of the dorsal fin is midway between the end of the snout and the root of the caudal. Sometimes with small black spots.

Pharyngeal teeth 4 or 5—5 or 4, cultriform. (*Girard.*)

California.

50. Leuciscus bicolor.

Algansea bicolor, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 183; and *U. S. & Pac. R. R. Exped. Fish.* p. 238.

D. 1/9. A. 1/9.

Nine longitudinal series of scales between the origin of the dorsal fin and the lateral line, and five between the lateral line and the root of the ventrals. The length of the head is two-ninths of the total (with the caudal), the diameter of the eye two-ninths of the length of the head. The maxillary does not reach the vertical from the front margin of the orbit. The origin of the dorsal fin is somewhat behind that of the ventrals, and nearer to the root of the caudal than to the end of the snout. Coloration uniform.

Pharyngeal teeth 4 or 5—5 or 4, cultriform. (*Girard.*)

Klamath Lake, Oregon.

2. *The dorsal fin commences behind the root of the ventrals. Rudimental caudal rays not unusually developed.*

a. *Pharyngeal teeth in two series.*

aa. *Lateral line complete; pharyngeal teeth 5 or 4 . 2—2 . 5 or 4* (Clinostomus).

51. Leuciscus elongatus.

Luxilus elongatus, *Kirtland, Rep. Zool. Ohio*, pp. 169, 192; and *Bost. Journ. Nat. Hist.* iii. p. 339, pl. 4. fig. 1.
Leuciscus elongatus, *Storer, Synops.* p. 161; *Cuv. & Val.* xvii. p. 494.
—— productus, *Storer, Synops.* p. 164.
Clinostomus elongatus, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 212.

D. 9. A. 10. V. 9. L. lat. 72. L. transv. 12/11.

The height of the body is contained five times in the total length (without caudal), the length of the head thrice and four-fifths. Head not twice as long as deep, flat above; the width of the interorbital space is a little less than the length of the snout. The diameter of the eye is contained thrice and two-thirds in the length of the head, and rather less than that of the snout. Mouth oblique, wide, the maxillary extending beyond the front margin of the eye; *mandible projecting beyond the upper jaw*; lips moderately developed. Suborbitals narrow; præorbital scarcely longer than deep, larger than the postorbital, which is scarcely wider than the preceding bone. *The origin of the dorsal fin is behind the vertical from the base of the ventral,* and somewhat nearer to the root of the caudal than to the end of the snout. Caudal fin forked. There are seven longitudinal series of scales between the lateral line and ventral fin. A more or less conspicuous bluish or blackish band along the side of the head and body.

Pharyngeal bones rather narrow, with two series of compressed, hooked teeth, 4 . 2—2 . 5 or 4. Gill-rakers short, pointed. The attachment of the gill-membrane to the isthmus takes place opposite to the hind margin of the orbit.

United States.

a. Adult. New York. Presented by Th. Moore, Esq.

52. Leuciscus proriger.

Squalius proriger, *Cope, Proc. Ac. Nat. Sc. Philad.* 1864, p. 280.
Clinostomus proriger, *Cope, Trans. Am. Phil. Soc.* xiii. p. 375.

D. 1/8. A. 1/9. V. 8. L. lat. 62. L. transv. 10/?.

The lower jaw presents a symphysial knob beyond and above the premaxillary border; end of the maxillary opposite to the middle of the pupil. The length of the head is contained four times in the total to the concavity of the tail, the height of the body five times and one-fourth. The diameter of the eye is one-fourth of the length of the head. Ventral fins a little in advance of dorsal, not reaching the vent; dorsal fin somewhat nearer to the base of the caudal than to the end of the snout. There are five longitudinal series of scales between the lateral line and ventral fin. Sides punctulate anteriorly.

Pharyngeal teeth 5 . 2—1 . 4. (*Cope.*)

Ohio. Three inches long.

53. Leuciscus margarita.

Clinostomus margarita, *Cope, l. c.* p. 377, pl. 13. fig. 1.

D. 9. A. 9. V. 8. L. lat. 58. L. transv. 11/?.

The height of the body equals the length of the head, and is one-fourth of the total (without caudal) The diameter of the eye is one-third of the length of the head, and more than that of the snout, which is obtuse. Cleft of the mouth oblique, narrow, with the jaws even in front, the maxillary scarcely reaching to below the front margin of the orbit. Origin of the dorsal fin behind that of the ventrals, and nearer to the root of the caudal than to the end of the snout. Pectoral terminating at some distance from the ventrals. There are eight or nine longitudinal series of scales between the lateral line and ventral fin.

Pharyngeal teeth 5 . 2—2 . 4. (*Cope.*)

From a tributary of the Conestoga, near Lancaster, Pennsylvania.

bb. *Lateral line complete; pharyngeal teeth* 3 . 1—1 . 3 [?] (Tiaroga).

54. Leuciscus cobitis.

Tiaroga cobitis, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 204; and *U. St. & Mex. Bound. Ichthyol.* p. 60, pl. 28. figs. 11–14.

"Head small, subconical, depressed. Mouth obliquely terminal, of moderate size, and without barbels of any kind. Upper jaw slightly longer than the lower. Eye of medium size. Isthmus very wide. Body slender, subfusiform, compressed. Fins are well developed; dorsal and anal narrow and high; caudal bifurcated. The insertion of the ventrals takes place in advance of the anterior margin of the dorsal. The scales are small; the lateral line, medial. The pharyngeals are similar to those in *Gobio*. The teeth are likewise of the same character: slender, subcylindrical upon their base, compressed above, of the raptatorial kind of the hooked type, without grinding surface, 1 . 3—3 . 1.

"About two inches and a half in total length, the head forming about the fifth of it. The eyes approximate the upper surface of the head, which is rounded. The upper regions are brownish, with small blackish spots; the inferior regions are unicolor of a yellowish tint. A black spot upon the base of the caudal fin."

Rio San Pedro, a tributary of the Rio Gila.

cc. *Lateral line incomplete* (Phoxinus, sp.).

55. Phoxinus neogæus.

Chrosomus eos, *Cope, Proc. Ac. Nat. Sc. Philad.* 1864, p. 281 (not 1861, p. 523).

Phoxinus neogæus, *Cope, Trans. Am. Phil. Soc.* xiii. p. 375.

D. 8. A. 8. V. 8. L. lat. 77.

The height of the body is a little less than the length of the head, which is one-fourth of the total (without caudal). Origin of the dorsal fin nearer to the root of the caudal than to the end of the snout. Snout shorter than the diameter of the eye, which is two-sevenths of the length of the head; mouth oblique, reaching to the vertical from the orbit. Lateral line incomplete. Pectoral fins terminating at a great distance from the ventral. A blackish band along the lateral line, terminating in a black caudal spot.

Pharyngeal teeth 5 . 2—2 . 4. (*Cope.*)

New Hudson (Michigan).

b. *Pharyngeal teeth in a single series* (Pseudophoxinus, sp.).

56. Leuciscus erythrogaster.

Luxilus erythrogaster, (*Rafin.*) *Kirtland, Bost. Journ. Nat. Hist.* iv. 1844, p. 23, pl. 2. fig. 2.

Chrosomus erythrogaster, *Cope, Trans. Am. Phil. Soc.* xiii. p. 391.

D. 10. A. 9. V. 8.

Scales minute. Upper jaw slightly overlapping the lower; maxillary extending to below the front margin of the orbit; body thick, slightly compressed, its depth being one-fifth of the total length (without caudal); the length of the head is one-fourth of it. Males with two brown longitudinal bands—one from the snout, through the eye, below the lateral line to the caudal, the other from above the gill-opening to the caudal. The remainder of the side and belly silvery (the latter reddish in the spawning-season). Females with the bands indistinct.

Pharyngeal teeth 4 or 5—5.

Ohio; Michigan.

This diagnosis is taken from a fine example in the Liverpool Museum, 2½ inches long.

Mr. Cope distinguishes another species under the name of *Chrosomus cos*, Proc. Ac. Nat. Sc. Philad. 1861, p. 523; or Trans. Am. Phil. Soc. xiii. p. 391. It is said to be distinguished by a "mouth not reaching line of orbit, by the dark lines united on caudal peduncle; no lateral line." Susquehannah River.

3. *The dorsal fin commences behind the root of the ventrals. Rudimental caudal rays much developed. Pharyngeal teeth in a single series* (Lavinia).

57. Leuciscus exilicauda.

Lavinia exilicauda, *Baird & Girard, Proc. Ac. Nat. Sc. Philad.* 1854, p. 137, and 1856, p. 184; *U. S. Pac. R. R. Exped. Fish.* p. 241, pl. 54. figs. 1–4.

—— compressa, *Ayres, Proc. Calif. Acad. Nat. Sc.* 1855, p. 21.

D. 4–10. A. 4–11. V. 11. L. lat. 60–65. L. transv. 13/11.

The simple caudal rays are unusually strong. The height of the body is contained four times in the total length (without caudal), the length of the head four times and two-thirds. Head compressed. Snout of moderate extent, longer than the eye, the diameter of which is one-fifth of the length of the head, and at least one-half of the width of the interorbital space, which is convex. Mouth anterior, oblique, with the jaws nearly even. The maxillary does not reach the vertical from the front margin of the orbit. Præorbital a little smaller than the postorbital, which is not twice as wide as the preceding suborbital. Origin of the dorsal fin considerably nearer to the root of the tail than to the end of the snout, behind the base of the ventrals. Anal fin nearly as long as high, caudal broad, deeply forked. The length of the pectoral equals that of the ventral, and is three-fifths of the distance of its root from that of the ventral. Coloration uniform.

Gill-rakers slender, lanceolate; pharyngeal teeth 5—5, compressed, not denticulated, claw-shaped.

California.

a–b, c. Ten and eleven inches long. San Francisco. Presented by Dr. W. O. Ayres.

The description of *Lavinia harengus*, Girard, Proc. Ac. Nat. Sc. Philad. 1856, p. 184, or U. S. Pac. R. R. Exped. Fish. p. 242, from Monterey Plains, is of a very dubious character; moreover the author speaks of several specimens serving for the description in one place, enumerating one only in another.

B. *Fifty or less scales in the lateral line.*

1. *Pharyngeal teeth in two series.*

a. *Origin of the dorsal fin opposite to the root of the ventrals.*

58. Leuciscus cornutus.

Red-fin, Red Dace, Rough-head.
Cyprinus cornutus, *Mitchill, Am. Month. Mag.* i. p. 324.
Leuciscus cornutus, *Storer, Bost. Journ. Nat. Hist.* iv. p. 182; *Dekay, New York Faun. Fish.* p. 207, pl. 29. fig. 92.
Hypsolepis cornutus, *Storer, Mem. Amer. Acad.* v. 1855, p. 284, pl. 21. fig. 3; *Cope, Proc. Ac. Nat. Sc. Philad.* 1864, p. 279.
—— frontalis, *Agassiz, Lake Super.* p. 368, pl. 3. fig. 4.
—— gracilis, *Agassiz, l. c.* p. 370.
Plargyrus cornutus, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 196.
? Plargyrus bowmani, *Girard, l. c.*, and *U. S. & Pac. R. R. Exped. Fish.* p. 263, pl. 59. figs. 1–5.
Hypsilepis cornutus, *Cope, Trans. Am. Phil. Soc.* xiii. p. 372.

D. 9–10. A. 10–11. V. 8–9. L. lat. 43. L. transv. 8½/6.

The height of the body is nearly equal to the length of the head, and about one-fourth of the total (without caudal). Head two-thirds as deep as long. The diameter of the eye is one-fourth of the length of the head, and less than the width of the interorbital space, which is convex, and equals the length of the snout. Snout obtuse, mouth of moderate width, jaws even in front. Suborbital bones very narrow; præorbital as long as deep, much larger than the postorbital, which is not wider than the preceding bone. The origin of the dorsal fin is nearly opposite to that of the ventrals, and midway between the end of the snout and root of the caudal. Caudal fin forked. The pectoral fins terminate at a short distance from the ventrals. Scales much higher than long on the side of the body, and much larger than those on the back and belly. There are three and a half longitudinal series of scales between the lateral line and ventral fin. A more or less conspicuous dark longitudinal band along the side of the tail. (Fins red during the spawning-season.)

Pharyngeal teeth compressed, hooked, 4 . 2—2 . 4. Gill-rakers short, conical, few in number; the attachment of the gill-membrane to the isthmus takes place opposite the angle of the præoperculum. (Head with tubercles in the spawning-season.)

United States.

a. Fine specimen. Michigan. Purchased of Mr. Wright.
b. Half-grown. Flint, Michigan. Presented by Th. Moore, Esq. (*Hypsolepis frontalis.*)
c–f. Adult. Miami River. Purchased of Mr. Cope.
g. Skins of numerous examples. Lake Erie. Purchased of Mr. Parnell.
h–i. Adult (deteriorated by want of food). Montreal. Purchased of Mr. Wright.

59. Leuciscus diplemius.

Leuciscus diplemius, (*Rafin.*) *Kirtland, Bost. Journ. Nat. Hist.* v p. 276, pl. 22. fig. 3.
Hypsolepis diplemius, *Putnam, MS.*; *Cope, Trans. Am. Phil. Soc.* xiii. p. 373.

D. 9. A. 10. V. 8. L. lat. 43. L. transv. 7/5.

The height of the body is contained thrice and three-fourths in the total length (without caudal), the length of the head four times. Head three-fourths as deep as long. The diameter of the eye is less than one-fourth of the length of the head, and much less than the width of the interorbital space, which is convex, and equals the length of the snout. Snout obtuse, mouth of moderate width, jaws even in front. Suborbital bones very narrow; præorbital as long as deep, much larger than the postorbital, which is not wider than the preceding bone. The origin of the dorsal fin is nearly opposite to that of the ventrals, and a little nearer to the end of the snout than to the root of the caudal. Caudal fin forked. The pectoral fins terminate at some distance from the ventrals. Scales much higher than long on the side of the body, and much larger than those on the back and belly. There are three longitudinal series of scales between the lateral line and ventral fin. Coloration of preserved specimens uniform.

Pharyngeal teeth compressed, hooked, 4 . 1—1 or 2 . 4.

Ohio.

a. Five inches long. Sciota River, Ohio. Presented by Th. Moore, Esq.

60. Leuciscus storerianus.

Rutilus storerianus, *Kirtland, Proc. Bost. Soc. Nat. Hist.* i. 1842, p. 71.
Leuciscus storerianus, *Kirtland, Bost. Journ. Nat. Hist.* v. 1845, p. 30, pl. 9. fig. 2; *Storer, Synops.* p. 265.
Hybopsis storerianus, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 211.

D. 9–10. A. 9. L. lat. 41. L. transv. 6/5.

Head and body oblong. The height of the body is somewhat more than one-fifth of the total length (without caudal), the length of the head nearly one-fourth. Head two-thirds as deep as long. Eye large, a little less than one-third of the length of the head, equal to the width of the interorbital space, and *rather longer than the snout*. Snout obtuse, overlapping the small horizontal mouth; suborbital bones very narrow; præorbital a little longer than deep, larger than the postorbital. The origin of the dorsal fin is opposite to that of the ventrals, and midway between the end of the snout and root of the caudal. Caudal fin deeply forked. The pectoral fins terminate at some distance from the ventrals. There are three and a half longitudinal series of scales between the lateral line and ventral fin. Silvery; each scale of the lateral line with more or less conspicuous brown dots, sometimes forming a dark longitudinal lateral band.

Pharyngeal teeth slightly compressed and hooked, 4 . 1 or 0*—1 . 4.

United States.

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* The inner tooth is frequently deciduous.

a. Four inches long. Susquehannah River. Presented by Thomas Moore, Esq.

I am unable to find in this fish the barbel described by Girard.

Prof. Agassiz mentions an *Hybopsis dorsalis* (Sillim. Journ. 1854, xvii. p. 358) from Iowa, without giving a characteristic diagnosis. We have examined three specimens sent by him to the Liverpool Museum; they are a little more than an inch long, and appear to be the young of *L. storerianus*.

61. Leuciscus hudsonius.

The Spawn-eater. (Smelt.)
Clupea hudsonia, *Clinton, Ann. Lyc. Nat. Hist. New York*, i. 1824, p. 49, pl. 2. fig. 2.
Leuciscus hudsonius, *Dekay, Nat. Hist. New York, Fish.* p. 206, pl. 34. fig. 109; *Storer, Synops.* p. 157; *Agassiz, Lake Super.* p. 272.
Hudsonius fluviatilis, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 210.
—— amarus, *Girard, l. c.*
Hypopsis phaënna, *Cope, Proc. Ac. Nat. Sc. Phil.* 1864, p. 279.
—— hudsonius, *Cope, Trans. Am. Phil. Soc.* xiii. p. 386, pl. 12. fig. 3.

D. 9. A. 9. L. lat. 38–39. L. transv. 6/6.

Head and body oblong. The length of the head is somewhat more than one-fifth of the total (without caudal), the height of the body one-fourth. Head two-thirds as deep as long. Eye large, one-third of the length of the head, equal to the width of the interorbital space, and considerably *longer than the snout*. Snout very obtuse, overlapping the small horizontal mouth. Suborbital bones very narrow; præorbital as long as deep, larger than the postorbital. The origin of the dorsal fin is opposite to that of the ventrals, and nearly midway between the end of the snout and root of the caudal. Caudal fin forked. The pectoral fins terminate at some distance from the ventrals. There are three and a half longitudinal series of scales between the lateral line and ventral fin. Silvery; a blackish spot on the root of the caudal.

Pharyngeal teeth 4 . 2 or 0—1 or 2 . 4.

United States.

a. Three inches long. Lake Superior. Presented by Thomas Moore, Esq.

62. Leuciscus kentuckiensis.

Luxilus kentuckiensis, *(Rafin.) Kirtland, Bost. Journ. Nat. Hist.* v. p. 27, pl. 8. fig. 3.
Leuciscus kentuckiensis, *Storer, Mem. Amer. Ac.* ii. p. 410.
Cyprinella kentuckiensis, *Cope, Proc. Ac. Nat. Sc. Philad.* 1864, p. 279.
Hypsilepis kentuckiensis, *Cope, Trans. Am. Phil. Soc.* xiii. p. 371, pl. 11. fig. 3.

D. 9. A. 10. L. lat. 38–40. L. transv. 6–7/5.

The height of the body is contained four times in the total length (without caudal), the length of the head four times and one-third. Snout somewhat acute, longer than the diameter of the eye, which is one-fourth or one-fifth of the length of the head; upper jaw slightly overlapping the lower; the maxillary does not extend to below the front margin of the orbit. Origin of the dorsal fin a little nearer to the root of the caudal than to the end of the snout, opposite to the middle of the root of the ventral. Caudal fin forked; pectoral fins not extending to the ventrals. There are three or four longitudinal series of scales between the lateral line and ventral fin. Dorsal fin with the interradial membrane black, sometimes between all the rays, sometimes between the three last only; caudal fin white at the base. Upper surface of the head of the male with tubercles during the spawning-season. Pharyngeal teeth compressed, hooked, with a crenulate edge, 4 . 1—1 . 4.

United States.

a. Adult. Pennsylvania. Purchased of O. Salvin, Esq.
b–f. Fine specimens. Holston River. Received from Mr. Cope as *Hypsilepis galacturus* (Cope).

63. **Leuciscus photogenis.**

Squalius photogenis, *Cope, Proc. Ac. Nat. Sc. Philad.* 1864, p. 280.
Photogenis leucops, *Cope, Trans. Am. Phil. Soc.* xiii. p. 379, pl. 12. fig. 6.

D. 11. A. 10. V. 9. L. lat. 39. L. transv. 5/5.

The length of the head is contained four times and a fourth in the total (without caudal), *the height of the body six times or five times and a half. The diameter of the eye equals the length of the snout* (in adult examples), *and is two-sevenths of that of the head. Mouth oblique, under jaw scarcely projecting*; maxillary scarcely extending to the vertical from the front margin of the orbit. Scales caducous. Origin of the ventral fins little anterior to that of the dorsal, the origin of which is a little nearer to the base of the caudal than to the end of the snout. The ventral fins terminate at some distance from the vent. A silvery lateral band.

Pharyngeal teeth 4 . 1—1 . 4.

Pennsylvania and Virginia.

a–d. Adult. Kenhawa River. From Mr. Cope's Collection.

64. **Leuciscus telescopus.**

Photogenys telescopus, *Cope, MS.*

D. 10. A. 11. V. 8. L. lat. 35. L. transv. 5/5.

The length of the head is contained four times in the total (without caudal), the height of the body four times and two-thirds. *The diameter of the eye is a little more than the length of the snout* (in adult examples), *and one-third of that of the head.* Mouth oblique, under jaw scarcely projecting; maxillary scarcely extending to the vertical from the front margin of the orbit. Scales caducous. Origin of the ventral fins somewhat anterior to that of the dorsal, the origin of which is a little nearer to the base of the caudal than to the end of the snout. The ventral fins extend nearly to the vent. Silvery, plumbeous along the middle of the side of the tail.

Virginia.

a. Several adult and young examples. Holston River. From Mr. Cope's Collection.

65. Leuciscus coccogenis.

Hypsilepis coccogenis, *Cope, MS.*

D. 10. A. 10. V. 8. L. lat. 42. L. transv. $6\frac{1}{2}/4\frac{1}{2}$.

The height of the body is nearly equal to the length of the head, which is a little less than one-fourth of the total (without caudal). Eye of moderate size, its diameter being one-fourth of the length of the head, less than that of the snout and than the width of the interorbital space, which is flat. Snout somewhat produced and conical, the lower jaw somewhat projecting beyond the upper; cleft of the mouth rather wide, oblique, extending to below the front margin of the eye. Præorbital a little less deep than long, larger than the postorbital, which is narrow, scarcely wider than the preceding suborbital. Origin of the dorsal fin opposite to the middle of the root of the ventrals, and nearly midway between the end of the snout and the root of the caudal. Caudal fin forked. Pectorals terminating at a considerable distance from the ventrals. There are two and a half longitudinal series of scales between the lateral line and the root of the ventral fin. Basal half of the dorsal and caudal fins white, the outer black; margin of the upper jaw, base of the operculum, and a spot on the base of the anterior dorsal rays red. A black vertical streak along the humeral arch.

Virginia.

a. Several fine adult and young specimens. Holston River. From Mr. Cope's Collection.

66. Leuciscus zonatus.

Alburnus zonatus, *Agassiz, in Bullet. Mus. Compar. Zool. Cambridge, U. S.* 1863, p. 9.

D. 9. A. 10. V. 8. L. lat. 37–38. L. transv. $6\frac{1}{2}/5\frac{1}{2}$.

The height of the body is two-ninths of the total length (without caudal), the length of the head one-fourth. Eye large, its diameter being one-third of the length of the head, a little more than that of the snout and than the width of the interorbital space. Snout slightly convex, *the lower jaw somewhat projecting beyond the upper*; cleft of the mouth of moderate width, oblique, extending to below the front margin of the eye. Præorbital about as deep as long, much larger than the postorbital, which is narrow, a little wider than the preceding suborbital. Origin of the dorsal fin opposite to that of the ventrals, and midway between the end of the snout and the root of the caudal. Caudal fin forked. Pectorals terminating at a considerable distance from the ventrals. There are four longitudinal series of scales between the lateral line and the root of the ventral fin. A blackish median line along the back. Body silvery, with a more or less distinct brownish band from the snout to the end of the middle caudal rays.

Pharyngeal teeth 4 . 1—1 . 4. The attachment of the gill-membranes to the isthmus takes place opposite to the angle of the præoperculum. Gill-rakers short, pointed, few in number.

Osage River.

This description is taken from an example in the Liverpool Museum, 3½ inches long.

67. Leuciscus spilopterus.

Photogenis spilopterus, *Cope, Trans. Am. Phil. Soc.* xiii. p. 378.

D. 9. A. 1/8. V. 7–8. L. lat. 38. L. transv. 6/?.

The height of the body is contained five times in the total length (without caudal), the length of the head four times and one-third; snout as long as the diameter of the eye, which is two-sevenths of the length of the head; mouth oblique, the maxillary extending to the vertical from the front margin of the orbit. The pectoral fins terminate at a great distance from the ventrals. Origin of the dorsal fin a little nearer to the root of the caudal than to the end of the snout. There are two longitudinal series of scales between the lateral line and ventral fin. A plumbeous band along the hinder half of the lateral line; a spot on the upper hinder portion of the dorsal, and a narrow vertebral line, black.

Pharyngeal teeth sharp-edged, 4 . 1—1 . 4. (*Cope.*)

St. Joseph's River, South-west Michigan.

b. *Origin of the dorsal fin distinctly behind the ventrals.*

68. Leuciscus rubellus.

Alburnus rubellus, *Agassiz, Lake Super.* p. 364, pl. 3. figs. 1–3; *Cope, Proc. Ac. Nat. Sc. Philad.* 1864, p. 282.

D. 1/9. A. 2/10. V. 8. L. lat. 38. L. transv. 6/?.

The height of the body is one-sixth of the total length (without caudal), the length of the head two-ninths. Snout moderately pointed, *with the lower jaw slightly projecting beyond the upper.* Mouth of moderate width, the maxillary extending to below the front margin of the orbit. *Ventral fins in advance of the dorsal,* the origin of which is nearer to the root of the caudal than to the end of the snout. Caudal fin moderately forked; pectorals terminating at some distance from the root of the ventrals. Three longitudinal series of scales between the lateral line and the root of the ventral fin. Sides of the body with a silvery band.

Pharyngeal teeth 4 . 2—2 . 4.

Lake Superior.

This species cannot well be referred to a genus which is distinguished from *Leuciscus* by a many-rayed anal fin. See also *Abramis oligaspis,* p. 309.

69. Leuciscus hypselopterus.

Alburnus formosus, *Putnam, MS.* (*not* Algansea formosa, *Girard*).

D. 9. A. 11. L. lat. 38. L. transv. 6½/5.

The height of the body is equal to the length of the head, and one-fourth of the total (without caudal); the diameter of the eye is more than the length of the snout, and one-third of that of the head. Snout rather pointed; cleft of the mouth oblique, with the jaws even in front, extending to below the front margin of the eye. The origin of the dorsal fin is behind the ventrals, and midway between the root of the caudal and the eye; its last ray is opposite to the first anal ray. *Dorsal fin and, particularly, anal fin elevated,* the longest anal rays being longer than the base of the fin. A broad diffuse brownish band along the side, terminating in a dark spot on the root of the caudal fin. Dorsal fin blackish, with the base and top colourless.

Pharyngeal teeth 4.1—1.4; gill-rakers rudimentary; pseudobranchiæ.

Mobile. Two inches long.

a. Two inches long. Mobile. Presented by Th. Moore, Esq.

70. Leuciscus rubrifrons.

Alburnus rubrifrons, *Cope, Proc. Ac. Nat. Sc. Philad.* 1865, p. 85.
Alburnellus rubrifrons, *Cope, Trans. Am. Phil. Soc.* xiii. p. 388, pl. 13. fig. 3.

D. 9. A. 2/10. V. 8. L. lat. 39. L. transv. 6/?.

The height of the body is two-ninths of the total length (without caudal), the length of the head one-fourth. Snout moderately pointed, mouth oblique, *with the lower jaw slightly projecting beyond the upper*; the maxillary extends to below the front margin of the orbit. The diameter of the eye is as long as the snout, and one-fourth (according to the figure two-sevenths) of the length of the head. *Ventral fins in advance of dorsal,* the origin of which is considerably nearer to the root of the caudal than to the end of the snout. Pectoral fins terminating at some distance from the root of the ventrals. There are two or three longitudinal series of scales between the lateral line and ventral fin. A dark lateral band.

Pharyngeal teeth 4.2—2 or 1.4. (*Cope.*)

Pennsylvania.

71. Leuciscus copii.

Alburnellus jaculus, *Cope, l. c.* p. 387.

D. 10. A. 10. V. 8. L. lat. 39. L. transv. 6/5.

The height of the body is one-seventh of the total length (without caudal), the length of the head two-ninths. Eye of moderate size, its diameter being a little more than one-fourth of the length of the head, less than that of the snout, and equal to the width of the interorbital space, which is flat. Snout pointed, the lower jaw somewhat projecting beyond the upper; cleft of the mouth of moderate width, oblique, extending to below the front margin of the eye. Origin of the dorsal fin behind the ventrals, and nearer to the root of the caudal than to the end of the snout. Caudal fin forked. Pectorals terminating at a considerable distance from the ventrals. There are three longitudinal series of scales between the lateral line and the root of the ventral fin. Silvery.

Virginia; Michigan.

a–c. Three inches long. Walker's Creek, Kenhawa River. From Mr. Cope's Collection.

72. Leuciscus anolostanus.

Cyprinella anolostana, *Girard, Proc. Ac. Nat. Sc. Philad.* 1859, p. 58; *Cope, ibid.* 1864, p. 279.

D. 10. A. 10. V. 8. L. lat. 39. L. transv. 6½/5.

The height of the body is contained four times in the total length (without caudal), the length of the head thrice and four-fifths. Snout of moderate extent, rather longer than the diameter of the eye, which is one-fourth of the length of the head; upper jaw slightly overlapping the lower; the maxillary does not extend to below the front margin of the orbit. Origin of the dorsal fin conspicuously nearer to the root of the caudal than to the end of the snout, *and behind the root of the ventral*. Caudal fin forked; pectoral fins not extending to the ventrals. There are three longitudinal series of scales between the lateral line and ventral fin. Scales much higher than long. Silvery, each scale with a darker margin; a black vertical band along the humeral arch. Dorsal fin with the interradial membrane black, the black being more intense between the posterior rays than between the anterior. Upper surface of the head tubercular in the spawning-season.

Virginia.

a–c. Adult. Kenhawa River. From Mr. Cope's Collection.

73. Leuciscus vandoisulus.

Cuv. & Val. xvii. p. 317.

D. 10. A. 11. L. lat. 47. L. transv. 8/?.

The height of the body equals the length of the head, which is one-fourth of the total (without caudal). Lower jaw longer than the upper. Origin of the dorsal fin midway between the end of the central caudal rays and the end of the snout. Three longitudinal series of scales between the lateral line and ventral fin. (*Val.*).

Pharyngeal teeth 5 . 2—2 . 5.

North America. Seven inches long.

74. Leuciscus funduloides.

Clinostomus funduloides, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 212; *Cope, Trans. Am. Phil. Soc.* xiii. p. 376, pl. 13. fig. 2.

D. 10. A. 9. L. lat. 46–50. L. transv. 9/?.

The height of the body equals the length of the head, which is one-fourth of the total (without caudal). The diameter of the eye is rather less than one-third of the length of the head, and equal to that of the snout, which is rather pointed. Cleft of the mouth oblique, with the lower jaw slightly prominent, the maxillary extending beyond the front margin of the orbit. Origin of the dorsal fin nearly midway between the root of the caudal and the end of the snout, *and behind the ventral fin.* Pectoral extending to the root of the ventral. There are four longitudinal series of scales between the lateral line and ventral fin.

Pharyngeal teeth 5 . 2—2 . 4.

Males with tubercles on the scales (*Cope*).

United States.

75. **Leuciscus affinis.**

Clinostomus affinis, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 212.

Scarcely distinct from *L. funduloides.*

D. 10. A. 9. L. lat. 46. L. transv. 9/7.

The height of the body is nearly equal to the length of the head, which is contained thrice and two-thirds in the total (without caudal). The diameter of the eye is nearly one-fourth of the length of the head, and a little less than that of the snout, which is rather pointed. Cleft of the mouth oblique, with the lower jaw not prominent, the maxillary extending to below the front margin of the orbit. Origin of the dorsal fin rather nearer to the root of the caudal than to the end of the snout. Pectoral extending to the root of the ventral. There are four longitudinal series of scales between the lateral line and ventral fin.

Virginia.

a–c. Head of James River. From Mr. Cope's Collection.

Girard (Proc. Ac. Nat. Sc. Philad. 1856, p. 212) distinguishes another species belonging to the group which he has named *Clinostomus* and distinguished by its prominent lower jaw, backward position of dorsal fin, and double series of pharyngeal teeth—*Clinostomus carolinus.* The head is larger than in *C. affinis*, and the body more elongated, compared with the depth. The eye is a great deal larger, and the scales smaller. Blackish brown above, with scattered black spots; reddish beneath; flanks golden.—From Salem, North Carolina.

76. **Leuciscus ardens.**

Hypsilepis ardens, *Cope, MS.*

D. 10. A. 12–13. V. 8. L. lat. 48. L. transv. 7/5.

The height of the body is one-fifth of the total length (without caudal), the length of the head rather less than one-fourth. Eye large, its diameter being two-sevenths of the length of the head, equal to that of the snout, and rather less than the width of the interorbital space, which is flat. Snout pointed, the lower jaw not projecting beyond the upper when the mouth is closed; cleft of the mouth of moderate width, oblique, extending to below the front margin of the eye. Origin of the dorsal fin behind the root of the ventrals, and conspicuously nearer to the root of the caudal than to the end of the snout. Caudal fin forked. Pectorals terminating at some distance from the ventrals. There are three longitudinal series of scales between the lateral line and the root of the ventral fin. Silvery; dorsal and anal fins with a reddish tinge; a black spot on the base of the anterior dorsal rays.

Virginia.

a–h. Three inches long. Roanocke River. From Mr. Cope's Collection.

2. *Pharyngeal teeth in a single series* (Moniana).

77. Leuciscus gardoneus.

Leuciscus gardoneus, *Cuv. & Val.* xvii. p. 316.
Chondrostoma gardoneum, *Cope, Journ. Ac. Nat. Sc. Philad.* xiii. p. 395.

D. 11. A. 10. L. lat. 39. L. transv. 7/?.

The height of the body is one-fourth of the total length; the length of the head one-sixth of that of the body; the diameter of the eye two-sevenths of the length of the head. Origin of the dorsal fin midway between the end of the snout and the root of the caudal fin, which is but slightly forked. Three longitudinal series of scales between the lateral line and ventral fin. Coloration uniform.

Pharyngeal teeth hooked, with a slightly crenulated edge, 5—5. (*Val.*)

United States.

Mr. Cope's assertion that this fish is a *Chondrostoma* requires further confirmation.

78. Leuciscus lutrensis.

Leuciscus lutrensis, *Baird & Girard, Proc. Ac. Nat. Sc. Philad.* 1853, p. 391; and *in Marcy, Explor. Red River*, p. 251, *Zool.* pl. 14. figs. 9–12.
Moniana lutrensis, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 199; *U. S. & Pac. R. R. Exped. Fish.* p. 272.

D. 1/7. A. 1/9. V. 8. L. lat. 36.

Twelve longitudinal series of scales on the greatest height of the body. The length of the head equals the height of the body, and is two-sevenths of the total (without caudal). The diameter of the eye is one-fourth of the length of the head. Mouth oblique, with the jaws even in front, and with the maxillary not extending to below the front margin of the orbit. The ventral fins are in advance of the origin of the dorsal, which is midway between the end of the snout and the base of the caudal. Pectorals not quite extending to the root of the ventrals. Caudal forked. Coloration uniform.

Pharyngeal teeth 4—4. (*Girard.*)

Red River; Canadian River.

79. Leuciscus tuditanus.

Hybopsis tuditanus, *Cope, Journ. Ac. Nat. Sc. Philad.* xiii. p. 381.

L. lat. 43. Seven longitudinal series of scales above the lateral line, and four between it and the ventral fin. The height of the body is contained five times and one-third in the total length (without caudal), the length of the head four times and one-half; the diameter of the eye is two-sevenths of the length of the head. Head broad and flat; temporal region angulated; snout very thick and obtuse; mouth very small, inferior. Origin of the dorsal fin conspicuously nearer to the root of the caudal than to the end of the snout. Pectoral fins not reaching ventrals. Sometimes a dark longitudinal band on the side; a dark spot on the middle of the anterior dorsal rays, and a faint one on the base of the caudal. (*Cope.*)

Pharyngeal teeth 4—4.

Detroit and Wabash Rivers.

80. Leuciscus hæmaturus.

Hybopsis hæmaturus, *Cope, Journ. Ac. Nat. Sc. Philad.* xiii. p. 382, pl. 12. fig. 4.

D. 9. A. 8. L. lat. 44. L transv. 7/?.

The height of the body is about one-fifth of the total length (without caudal), the length of the head one-fourth; the diameter of the eye is two-sevenths of the length of the head. Snout little obtuse; mouth moderate, slightly oblique, terminal. Origin of the dorsal fin a little in advance of that of the ventral, midway between the end of the snout and the root of the caudal. Pectorals terminating at a great distance from the ventral. There are four (according to the figure, three) longitudinal series of scales between the lateral line and ventral fin. Tail red; a spot at the root of the caudal.

Pharyngeal teeth 4—4. (*Cope.*)

Michigan.

81. Leuciscus lineolatus.

? Alburnus lineolatus, *Agassiz.*

D. 9. A. 8. V. 8. L. lat. 34. L. transv. $5\frac{1}{2}/5$.

The height of the body is two-ninths of the total length (without caudal), the length of the head one-fourth. Free portion of the tail twice as long as deep. Head rather low. Eye rather large, its diameter being somewhat less than one-third of the length of the head, a little more than that of the snout, and equal to the width of the interorbital space. Snout somewhat convex, slightly overlapping the lower jaw; cleft of the mouth of moderate width, not extending to below the front margin of the eye. Præorbital about as deep as long, much larger than the postorbital, which is a little wider than the preceding suborbital. Origin of the dorsal fin opposite to that of the ventrals, and midway between the end of the snout and the root of the caudal. Caudal fin deeply forked. Pectorals terminating at a considerable distance from the ventrals. Lateral line complete. There are three and a half longitudinal series of scales between the lateral line and the root of the ventral fin. A blackish line along the median line of the back. Body light brown, with a broad silvery band having dark points extending from the head to the caudal fin.

Pharyngeal teeth 4—4, hooked. Gill-rakers short, pointed, few in number. The attachment of the gill-membranes to the isthmus takes place somewhat in advance of the præopercular margin.

Osage River.

a. Two inches long. Presented by Th. Moore, Esq.

This is one of two specimens sent by the Museum of Comparative Zoology, Cambridge, U.S., to the Liverpool Museum, with the name of *Alburnus lineolatus*. In the printed Bulletin of that Museum such a name is mentioned; but there is no means of ascertaining whether the specimens sent actually belong to the species for which that name is intended, as the diagnosis by which this species is distinguished consists of a few words only, indicative of colours which this species has in common with numerous other *Alburni* and *Leucisci*.—It will be evident from our description that this fish is not a species of *Alburnus*.

82. **Leuciscus procne.**

Hybognathus procne, *Cope, Proc. Ac. Nat. Sc. Philad.* 1864, p. 283.
Hybopsis procne, *Cope, Journ. Ac. Nat. Sc. Phil.* xiii. p. 385, pl. 11. fig. 2.

D. 9. A. 8. L. lat. 31. L. transv. 5/?.

The height of the body is about one-fifth of the total length (without caudal), the length of the head somewhat less than one-fourth. The free portion of the tail is more than twice as long as la- deep. There are three longitudinal series of scales between the teral line and the root of the ventral fin. The diameter of the eye is one-third, or rather more than one-third, of the length of the head. Pectoral not reaching ventral. Origin of the dorsal fin nearer to the end of the snout than to the root of the caudal*. A darkish streak along the lateral line. Pharyngeal teeth 5—4. (*Cope.*)

Conestaga River (Susquehannah); Delaware.

83. **Leuciscus volucellus.**

Hobognathus volucellus, *Cope, Proc. Ac. Nat. Sc. Phild.* 1864, p. 283.
Hybopsis volucellus, *Cope, Journ. Ac. Nat. Sc. Philad.* xiii. p. 381.

D. 1/8. A. 1/7. L. lat. 34. L. transv. 4/?.

Head depressed, elongate; fins elongate, especially the dorsal; the latter is as far from the end of the muzzle as from its anterior ray to the base of the caudal fin. Snout obtuse; vertex plane. Head entering (total) length to base of caudal thrice and three-fourths, the greatest depth four times; the diameter of the eye is contained thrice and one-third in the length of the head. Pectorals just reaching ventrals. Lateral line complete. There are three longitudinal series of scales between the lateral line and the root of the ventral fin. Coloration uniform, darkish on the root of the tail. (*Cope.*)

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* According to the figure it is equidistant from the two points.

Grosse Isle, Detroit River.

84. **Leuciscus heterodon.**

Alburnops heterodon, *Cope, Proc. Ac. Nat. Sc. Philad.* 1864, p. 281.
Hybopsis heterodon, *Cope, Journ. Ac. Nat. Sc. Philad.* xiii. p. 382.

D. 9. A. 8. V. 8. L. lat. 36. L. transv. 5/?.

Lateral line incomplete posteriorly. There are three longitudinal series of scales between the lateral line and ventral fin. The length of the head is nearly equal to the height of the body, and about one-fourth of the total length (without caudal). The diameter of the eye is one-third of the length of the head. Snout rather pointed; mouth anterior, oblique, with the lower jaw slightly projecting. Origin of the dorsal fin nearer to the end of the snout than to the root of the caudal. Pectorals terminating at a great distance from the ventrals. A dark lateral band runs from the snout to the caudal fin. (*Cope.*)

Pharyngeal teeth 4—4.

Lansing; Grosse Isle.

57. CTENOPHARYNGODON.

Ctenopharyngodon, *Steindachner, Verh. zool.-bot. Ges. Wien,* 1866, p. 782.

Body oblong. Scales of moderate size; lateral line complete, running nearly in the middle of the side of the tail. Dorsal fin short, without spine, opposite to the ventral; anal fin short. Mouth of moderate width, anterior, with the upper jaw somewhat longer. Both jaws with simple lips, the lower distinct at the angle of the mouth only. Upper jaw slightly protractile. Barbels none. Gill-rakers rather short, lanceolate, rather widely set. Pseudobranchiæ. The attachment of the branchial membrane to the isthmus takes place behind the vertical from the orbit. Pharyngeal teeth 5 . 2—2 . 4, those of the outer series very strong, strongly compressed, with the outer layer deeply folded.

China.

1. **Ctenopharyngodon idellus.**

Leuciscus idella, *Cuv. & Val.* xvii. p. 362 (faulty description); *Richardson, Ichth. Chin.* p. 297.
—— tschiliensis, *Basilewsky, Nouv. Mém. Soc. Nat. Mosc.* x. 1855, p. 233.
Ctenopharyngodon laticeps, *Steindachner, l. c.* tab. 18. figs. 1–5.

D. 10–11. A. 11. V. 10. L. lat. 40–42. L. transv. 7/8.

The height of the body equals the length of the head, and is a little less than one-fourth of the total (without caudal). Snout obtuse, depressed, sharpish transversely. Head very broad, the width of the interorbital space (which is convex) being equal to the length of the postorbital portion of the head, and considerably more than one-half of the length of the entire head. Eye rather small. Suborbital ring very narrow, the præorbital being larger than the hindmost suborbital. Scales with numerous radiating striæ, the interspaces between the striæ being transversely rugose. There are four longitudinal series of scales between the lateral line and the root of the ventrals. Opercles strong, and with numerous irregular grooves (for blood-vessels, as in the Carp). Origin of the dorsal fin somewhat in advance of that of the ventrals. Caudal fin deeply forked. Coloration uniform.

China.

a. Fine specimen, 19 inches long. From the Haslar Collection.
b. Adult: stuffed. Presented by J. Reeves, Esq.
c. Half-grown.
d. Skull of a large specimen. Voyage of H.M.S. 'Actæon.'

58. MYLOPHARODON.

Mylopharodon, *Ayres, Proc. Calif. Acad. Nat. Sc.* i. 1855, p. 35.

Scales small, lateral line present, running along the middle of the side of the tail. Dorsal fin short, without spinous ray, commencing opposite to the ventrals. Anal fin short. Mouth anterior, rather wide. *Intermaxillaries not protractile, the fold of the skin between maxillaries and intermaxillaries being discontinued on the upperside of the snout.* No barbel. Lower jaw with rounded margin and with the labial folds well developed laterally. Gill-rakers short, terminating in several minute points; the anterior quite rudimentary. Pseudobranchiæ. Pharyngeal teeth (5) 4 . 2—2 . 4, those of the outer series very stout, molar-like, with flat, oblique crown.

California.

1. Mylopharodon conocephalus.

Gila conocephala, *Girard, Proc. Ac. Nat. Sc. Philad.* 1854, p. 134.
Mylopharodon robustus, *Ayres, l. c.* p. 33; *Girard, U. S. & Pac. R. R. Exped. Fish.* p. 216, pl. 47.
—— conocephalus, *Girard, l. c.* pl. 46. figs. 5–8.

D. 10. A. 10. V. 10. L. lat. 74. L. transv. 17/15.

The height of the body is contained four times and two-thirds in the total length (without caudal), the length of the head four times and one-fourth. Snout produced, conical; eye small, its diameter being two-fifths of the length of the snout or of the width of the interorbital space (which is flattish), and two-sevenths of the length of the postorbital portion of the head. Præorbital elongate, postorbital nearly as large as the eye, and somewhat broader than the preceding suborbital. Mouth horizontal, with the jaws subequal in length, the maxillary extending nearly to below the front margin of the orbit. Origin of the dorsal fin a little behind that of the ventrals, and nearer to the root of the caudal than to the eye. Caudal fin deeply forked. There are seven longitudinal series of scales between the lateral line and the root of the ventral fin. Coloration uniform.

California.

a. Fine specimen, 14 inches long. River San Joaquin. Presented by Dr. W. O. Ayres.

59. PARAPHOXINUS.

Phoxinellus, sp., *Heckel.*
Paraphoxinus, *Bleeker, Atl. Ichth. Cypr.* p. 31.

Body scaleless, or with rudimentary, non-imbricate scales; lateral line more or less incomplete, with a series of scales. Dorsal fin short, without osseous ray, commencing somewhat behind the origin of the ventrals; anal short; caudal forked. Mouth anterior, without barbels. Pseudobranchiæ. Pharyngeal teeth subconical, 5—4.

Dalmatia; Bosnia

1. Paraphoxinus alepidotus.

Phoxinellus alepidotus, *Heckel, in Russegger's Reisen,* i. p. 1040; *Heck. & Kner, Süsswasserf.* p. 215.
Paraphoxinus alepidotus, *Bleeker, l. c.*

D. 10. A. 9.

Very similar to the Minnow. Scales only along the lateral line. Coloration uniform.

Bosnia; Dalmatia.

a–c. Adult. River Cettina. From the Milan Museum.

2. Paraphoxinus croaticus.

Phoxinellus croaticus, *Steindachner, Sitzgsber. Ak. Wiss. Wien,* 1865, lii. p. 594, with fig.

D. 10. A. 9. V. 8.

Body covered with very small, non-imbricate scales. A dark lateral band.

Croatia.

60. MEDA.

Meda, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 191.

"Body elongated, slender, compressed, fusiform in its profile, and scaleless. The lateral line may be traced along the middle of the flanks, slightly deflexed upon the abdomen. The head is elongated, subconical, rounded upon the snout without being truncated. The mouth is proportionally large, subterminal, its gape slightly oblique upwards, the lower jaw fitting into the upper. No barbels. The isthmus narrow. Dorsal fin higher than long, provided anteriorly with a stout, articulated, but simple and osseous ray, grooved posteriorly, and nearly as high as the second ray, which is slightly higher and the highest of all. The ventrals are inserted in advance of the anterior margin of the dorsal, and adherent to the ventral line for more than the half of their total length. The caudal is deeply furcated. Pharyngeal teeth subconical, hooked, 4 . 1—1 . 4."

South of North America.

The account given of this fish is very unsatisfactory. The writer compares the enlarged dorsal ray with that of *Barbus*; but in the figure it is represented in such a manner that I cannot help thinking that this ray is not more enlarged and ossified than in other typical Leuciscoid fish. Therefore I place this genus for the present in the *Leuciscina*, and not in the *Xenocypridina*, which are provided with a really osseous dorsal spine.

1. Meda fulgida.

Girard, l. c. p. 102; or *U. S. & Mex. Bound. Ichthyol.* pl. 28. figs. 9–10.

D. 9. A. 1/11*. V. 7.

Body rather low; the cleft of the mouth extends nearly to below the front margin of the orbit. Coloration uniform. (*Girard.*)

Rio San Pedro, tributary of the Gila.

61. TINCA.

Tinca, *Cuv. Règne Anim.*

Scales small, deeply imbedded in the thick skin; lateral line complete. Dorsal fin short, without spine, its origin being opposite the ventral fin; anal short; caudal subtruncated. Mouth anterior; jaws with the lips moderately developed; a barbel at the angle of the mouth. Gill-rakers short, lanceolate; pseudobranchiæ rudimentary. Pharyngeal teeth 4 or 5—5, cuneiform, slightly hooked at the end.

Europe.

1. Tinca vulgaris.

The Tench. Die Schleihe. La Tanche. Tenca. Lindare or Sutare (*Swed.*)

Tinca, *Auson.* v. p. 125; *Bellon.* i. p. 324; *Rondel.* ii. p. 157; *Salvian.* p. 90, tab. 89; *Gesner*, p. 984; *Aldrov.* v. p. 646; *Willughby*, p. 251, tab. 25. fig. 1; *Schonevelde*, p. 76; *Marsil. Danub. Pan.-Mys.* iv. p. 47, tab. 15.

Cyprinus, sp., *Artedi, Gen.* p. 4. no. 6; *Spec.* p. 27. no. 14; and *Synon.* p. 5. no. 7; *Gronov. Zoophyl.* no. 328.

Brama, sp., *Klein, Pisc. Miss.* v. p. 63, no. 6.

Cyprinus tinca, *L. Syst. Nat.* i. p. 526; *Müll. Prodr. Zool. Dan.* p. 50; *Leske, Ichthyol. Lips.* p. 30; *Bl. Fische Deutschl.* p. 83, taf. 14, p. 90, taf. 15 (variet.); *Bl. Schn.* p. 448; *Lacép.* v. p. 186; *Meidinger*, tab. 13; *Donovan, Brit. Fish.* v. pl. 113; *Pallas, Zoogr. Ross.-As.* iii. p. 310; *Ekström, Fische v. Mörkö*, p. 69; *Ekström & Fries, Skand. Fisk.* p. 205, pl. 52; *Gronov. Syst.* ed. *Gray*, p. 179.

Tanche, *Duhamel, Pêches*, ii. p. 506, tab. 26. fig. 1.

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* This number is given in the original text; eight branched rays are represented in the figure of natural size, and seven in the enlarged view of the specimen!

Tench, *Pennant, Brit. Zool.* iii. p. 314, and ed. 1812. iii. p. 474; *Couch, Fish. Brit. Isl.* iv. p. 22, pl. 183.

Tinca vulgaris, *Cuv. Règne Anim.*; *Fleming, Brit. An.* p. 186; *Nilss. Skand. Faun.* iv. p. 296; *Jurine, Poiss. Lac Lém.* p. 205, pl. 10; *Cuv. & Val.* xvi. p. 322, pl. 484; *Yarrell, Brit. Fish.* i. p. 328; 2nd edit. i. p. 375; 3rd edit. i. p. 389; *Nordmann, in Demid. Voy. Russ. Mérid.* iii. p. 481; *Kröyer, Danm. Fisk.* iii. p. 351; *Heckel & Kner, Süsswasserf.* p. 75. figs. 34 & 35; *Günth. Ann. & Mag. Nat. Hist.* 1859, iii. p. 385, pl. 16. figs. A & B; *Dybowski, Cyprin. Livland.* p. 66; *Siebold, Süsswasserf.* p. 106; *Canestrini, Arch. p. la Zoolog.* iv. 1866, p. 69; *Malmgren, Wiegm. Arch.* xxx. p. 310; *Blanchard, Poiss. France*, p. 317.

Tinca aurata, *Cuv. Règne An.*

Tinca chrysitis, *Agass. Mém. Soc. Sc. Nat. Neuch.* i. p. 37; *Sélys-Longch. Faun. Belge*, p. 202; *Bonap. Faun. Ital. Pesc.* c. fig.; *Rapp, Fische d. Bodensee's*, p. 5.

Tinca vulgaris, var. maculata, *Costa, Fauna Nap. Pesc.* tab. 12 (not good).

Tinca italica, *Bonaparte, l. c.*

Leuciscus tinca, *Günth. Fische d. Neckars*, p. 50.

D. 11–12. A. 9–10. V. 10–11. L. lat. 90–105. L. transv. $\frac{30-32}{18-22}$. Vert. 22/18.

Barbels very short; all the fins rounded; origin of the dorsal somewhat behind that of the ventrals.

Europe.

a–c. Adult: stuffed. England.
d. Adult: stuffed. Firth of Forth. Purchased of Mr. Parnell.
e. Young. London. From Yarrell's Collection.
f–g. Half-grown. Tunbridge. Presented by J. G. Children, Esq.
h. Young. River Seine. Purchased of M. Parzudaki.
i. Adult. Holland. From Dr. Bleekre's Collection.
k. Half-grown: skin. Holland. From Gronow's Collection.
l. Half-grown. River Maine. Presented by Dr. A. Günther.
m–n. Adult. Danube. From the Stuttgart Collection.
o–p. Half-grown. Würm-See, Bavaria. From Dr. Gemminger's Collection.
q. Adult. Constantinople. Purchased of Mr. Millingen.
r. Young. Nice. Purchased of Dr. Deakin.
s. Adult male: skeleton. England.
t. Adult female: skeleton. Berlin. From Dr. A. Günther's Collection.
u–v. Adult: skulls. Würtemberg. From Dr. A. Günther's Collection.

The following species is very imperfectly known, and its position in the system remains a matter of uncertainty until specimens from the same locality as that visited by Steller are reexamined. Having the caudal fin forked, it cannot be referred to *Tinca*:—

Cyprinus perenurus.

Pallas, Zoogr. Ross.-As. iii. p. 312.

“This fish, which never exceeds 5 inches in length, is in form very similar to the Tench, but thicker, ventricose, and with the scales small. The head is rather large, conical; the snout obtuse, the crown flattened; eyes rather large, prominent, with the iris golden; upper lip protractile, projecting over the lower, which is short. Sides of body thick and convex; back rounded, olive—resembling the Tench in colour and the smallness of the scales. Belly white, slightly silvery; lateral line curving towards the belly and becoming straight upon the tail; dorsal situated far back on the body, with a sheath on the base. Pectorals soft, red, with a thick caruncle at the base, of a blood-red hue. Ventrals remote, small, straight, and red; anal removed further back than dorsal, transparent and reddish; caudal forked, olive-brown."

Steller, from whose MS. this description is taken, found this fish in stagnant waters along the banks of the River Lena.

62. LEUCOSOMUS *.

Leucosomus, part., *Heckel, in Russegger's Reis.* i. 1841, p. 1042.
Pogonichthys, *Girard, Proc. Ac. Nat. Sc. Philad.* 1854, p. 136.
Cheilonemus, *(Baird) Storer, Mem. Amer. Acad.* 1855, p. 286.
Mylocheilus, *Agassiz, Sillim. Journ.* 1855, xix. p. 231.
Leucosomus, Pogonichthys, Semotilus (*Rafin.*), Nocomis *et* Mylocheilus, *Girard, l. c.* 1856, p. 189 *et seq.*

Scales of moderate or small size; lateral line present, running along the middle of the side of the tail. Dorsal fin short, without spinous ray, commencing opposite, or nearly opposite, to the ventral. Anal fin short. Mouth anterior or subanterior; intermaxillaries protractile. *A very small barbel at the extremity of the maxillary.* Lower jaw with rounded margin and with the labial folds well developed laterally. Gill-rakers short; pseudobranchiæ. Pharyngeal teeth in a double series.

North America.

* 1. Leucosomus dissimilis, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 189; or *U. S. & Pac. R. R. Exped. Fish.* p. 250.—Upper Missouri.
2. —— pallidus, *Girard, l. c.* 1°, p. 190; and *l. c.* 2°, p. 251, pl. 61. figs. 6–10.—Antelope Creek, Arkansas. (Appears to be closely allied to, if not identical with, *L. corporalis.*)
3. —— incrassatus, *Girard, l. c.* 1°; and *l. c.* 2°, p. 252, pl. 61. figs. 1–5.—Twenty miles west of Choctaw Agency.
4. Semotilus macrocephalus, *Girard, l. c.* 1°, p. 204; Leucosomus macrocephalus, *Girard, l. c.* 2°, p. 252.—Fort Pierre, Nebraska.
5. Semotilus speciosus, *Girard, l. c.* 1°; and *l. c.* 2°, p. 283, pl. 61. figs. 11–15.—Platte River.
6. Nocomis nebrascensis, *Girard, l. c.* 1°, p. 190; and *l. c.* 2°, p. 254.—Sweetwater, Nebraska River.
7. —— bellicus, *Girard, l. c.* 1°, p. 213.—Black Warrior River, Alabama.
8. Leuciscus pulchelloides, *Ayres, Proc. Bost. Soc. Nat. Hist.* iii. p. 157.—Connecticut.—L. lat. 60.

The species may be arranged thus:—

- I. Caudal lobes equally developed.
  - A. Pharyngeal teeth more or less compressed and tapering.
    - 1. Origin of the dorsal fin above, or in advance of, the root of the ventrals, p. 267.
    - 2. Origin of the dorsal fin behind the root of the ventrals, p. 269.
  - B. Some of the pharyngeal teeth obtuse and molar-like (*Mylocheilus*), p. 270.
- II. Upper caudal lobe more developed than the lower, p. 271.

I. *Caudal lobes equally developed.*

A. *Pharyngeal teeth more or less compressed and tapering.*

1. *Origin of the dorsal fin above, or in advance of, the root of the ventral.*

1. **Leucosomus symmetricus.**

Pogonichthys symmetricus, *Baird & Girard, Proc. Ac. Nat. Sc. Philad.* 1854, p. 136; *U. S. & Pac. R. R. Exp. Fish.* p. 246.

The length of the head is one-fifth of the total (with the caudal). Eye large, its diameter being contained less than four times in the length of the head. Lower jaw shorter than the upper; the maxillary does not extend to the vertical from the front margin of the eye. Origin of the dorsal fin nearer to the root of the caudal than to the end of the snout, and behind the origin of the ventrals. Caudal lobes equally developed. Coloration uniform. (*Girard.*)

San Joaquim Valley, California. Length 4½ inches.

2. **Leucosomus argyreiosus.**

Pogonichthys argyreiosus, *Girard, Proc. Ac. Nat. Sc. Philad.* 1854, p. 154; and *U. S. & Pac. R. R. Exped. Fish.* p. 246.

D. 10. A. 10. V. 10.

The length of the head is one-fifth of the total (with the caudal). Eye large, its horizontal diameter being contained a little over three times in the length of the head. Snout subconical, mouth subhorizontal; lower jaw shorter than the upper; the maxillary reaches to below the front margin of the eye. The origin of the dorsal fin is somewhat in advance of that of the ventrals, and equidistant from the end of the snout and the root of the caudal. Lobes of caudal fin equally developed. Pectorals rather small. (*Girard.*)

Presidio, California. Length 3¾ inches.

3. **Leucosomus communis.**

Pogonichthys communis, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 188; and *U. S. & Pac. R. R. Exp. Fish.* p. 247, pl. 55; *Cope, Proc. Ac. Nat. Sc. Philad.* 1864, p. 277.

D. 10. A. 11. V. 9.

Scales of moderate size. The height of the body is a little less than the length of the head, which is somewhat less than one-fifth of the total (without caudal). Eye small, one-seventh of the length of the head. Snout depressed and produced, the upper jaw overlapping the lower; mouth horizontal, the maxillary extending nearly to the vertical from the front margin of the orbit. Origin of the dorsal fin somewhat in advance of that of the ventrals, and much nearer to the end of the snout than to the root of the caudal. Caudal lobes equally developed. *Upper pectoral ray produced*; ventral fins reaching the anus. Coloration uniform. (*Girard.*)

Milk River; Platte River; Nebraska; Yellowstone River.

4. **Leucosomus gulonellus.**

Pogonichthys (Platygobio) gulonellus, *Cope, Proc. Ac. Nat. Sc. Philad.* 1864, p. 277.

D. 9. A. 9. V. 9. L. lat. 48. L. transv. 7/?.

The length of the head is two-ninths of the total, to the end of the middle caudal rays; the diameter of the eye is contained five times and two-thirds in the length of the head. Origin of the dorsal fin much nearer to the end of the snout than to the root of the caudal. Ventral fins truncate, terminating at a great distance from the vent. There are five longitudinal series of scales between the lateral line and ventral fin. A faint longitudinal dark band on one row of scales above the lateral line. (*Cope.*)

Bridger's Pass. Six inches long.

5. **Leucosomus pulchellus.**

Leuciscus argenteus, *Storer, Rep. Fish. Massach.* p. 90 (young).
—— pulchellus, *Storer, l. c.* p. 91 (adult); *Dekay, New York Faun. Fish.* p. 208; ? *Cuv. & Val.* xvii. p. 320.
Leucosomus argenteus, *Heckel, in Russegger's Reis.* i. p. 1043 (name only).
Leuciscus nitidus, *Dekay, l. c.* p. 209, pl. 33. fig. 105.
? Leuciscus chrysopterus, *Dekay, l. c.* p. 211, pl. 30. fig. 95.
Leuciscus storeri, *Cuv. & Val.* xvii. p. 319, pl. 505.
Cheilonemus pulchellus, *Storer, Mem. Am. Acad.* v. 1855, p. 286, pl. 22. fig. 2.
Leucosomus pulchellus, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 189.
Hybognathus nitidus, *Girard, l. c.* p. 210.
Semotilus corporalis, *Abbott, ibid.* 1861, p. 154.
Leucosomus rhotheus, *Cope, ibid.* p. 523.
Squalius hyalope, *Cope, ibid.* 1864, p. 280.
Semotilus rhotheus, *Cope, Journ. Ac. Nat. Sc. Philad.* xiii. p. 362, pl. 10. fig. 1.

D. 10. A. 10. V. 9. L. lat. 45–48. L. transv. $7\frac{1}{2}/7$. Vert. 25/19.

The height of the body is somewhat less than the length of the head, and nearly one-fourth of the total (without caudal). Head two-thirds as deep as long. The diameter of the eye is one-fifth of the length of the head in half-grown examples, and nearly one-seventh in adult. The width of the interorbital space, which is nearly flat, equals the length of the snout. Snout somewhat compressed, subconical. Mouth subhorizontal, rather wide, the maxillary extending to below the front margin of the orbit; upper jaw rather longer than the lower. Præorbital very large, the other suborbital bones narrow. The origin of the dorsal fin is nearly opposite to that of the ventrals, and midway between the end of the snout and the root of the caudal. Caudal fin forked. The pectoral fins terminate at a great distance from the ventrals. There are four longitudinal series of scales between the lateral line and ventral fin. Silvery, membrane at the base of each scale blackish. Young with an inconspicuous dark lateral band.

Pharyngeal teeth 4 . 2—2 . 5 or 4, but slightly compressed, terminating in a hook. Gill-rakers very short, and few in number. The attachment of the gill-membranes to the isthmus takes place opposite to the angle of the præoperculum.

United States; Canada.

a–b. Adult (18 inches long). Montreal. Purchased of Mr. Wright.
c–d. Fine adult specimens. Canada. Purchased of Mr. Wright.
e–h. Young. Canada. Purchased of Mr. Wright.
i. Adult: stuffed. Canada.
k–l. Young. Parmachenee Lake, Maine. Purchased of Mr. Wright.
m. Adult. Bangely Lake, Maine. Purchased of Mr. Wright.
n. Adult. Delaware River. Purchased of O. Salvin, Esq. (*Semotilus rhotheus,* Cope).
o. Adult female: skeleton. Montreal. Purchased of Mr. Wright.

2. *Origin of the dorsal fin behind the root of the ventrals.*

6. **Leucosomus corporalis.**

Cyprinus corporalis, *Mitchill, Am. Month. Mag.* ii. p. 324; *Dekay, New York Faun. Fish.* p. 213.
—— atromaculatus, *Mitchill, l. c.*
Leuciscus atromaculatus, *Dekay, l. c.* p. 210, pl. 32. fig. 102.
—— iris, *Cuv. & Val.* xvii. p. 255, pl. 496.
Semotilus atromaculatus, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 204.
Leucosomus cataractus, (*Baird*) *Cope, Proc. Ac. Nat. Sc. Philad.* 1861, p. 523.
Semotilus hammondii, *Abbott, Proc. Ac. Nat. Sc. Philad.* 1860, p. 474.
—— corporalis, *Cope, Journ. Ac. Nat. Sc. Philad.* xiii. p. 362, pl. 10. fig. 2.

D. 10. A. 10. V. 9. L. lat. 52–63. L. transv. $11\frac{1}{2}/13$.

The height of the body is contained four times and a half in the total length (without caudal), the length of the head thrice and three-fifths. Head three-fifths as deep as long. The diameter of the eye is one-sixth of the length of the head, one-half of that of the snout, and less than one-half of the width of the interorbital space, which is flattish. Snout obtuse, conical; mouth rather wide, the maxillary extending to below the front margin of the orbit; jaws nearly even in front. Suborbital bones of moderate width; præorbital as long as deep, very much larger than the postorbital, which is not wider than the preceding bone. The origin of the dorsal fin is behind the root of the ventrals, and more distant from the end of the snout than from the root of the caudal. Caudal fin moderately forked. The pectoral fins terminate at a considerable distance from the ventrals. Scales much higher than long on the side of the body. There are seven longitudinal series of scales between the lateral line and ventral fin. Humeral region blackish. A black spot on the base of the anterior dorsal rays; a dark longitudinal lateral band, terminating in a blackish spot at the base of the caudal fin, is more distinct in immature than in adult examples.

Pharyngeal teeth 4 . 2—2 . 4 or 5, but slightly compressed, terminating in a hook. Gill-rakers very short and few in number. The attachment of the gill-membranes to the isthmus takes place somewhat in advance of the angle of the præoperculum.

United States.

a–d. Adult and half-grown. Susquehannah River. Purchased of O. Salvin, Esq.
e. Adult. Tioga co., New York. Presented by Th. Moore, Esq.
f–h. Adult skins. Lake Erie. Purchased of Mr. Parnell.
i. Adult skin. Ohio Canal. Purchased of Mr. Parnell.

B. *Some of the pharyngeal teeth are obtuse and molar-like.*

7. Leucosomus caurinus.

Cyprinus (Leuciscus) caurinus, *Richards. Faun. Boreali-Amer. Pisc.* p. 304.
Mylocheilus lateralis, *Agass. & Pick. Sillim. Journ.* 1855, xix. p. 231; *Girard, in U. S. & Pac. R. R. Exped. Fish.* p. 214, pl. 48. figs. 5–8.
Mylocheilus caurinus, *Girard, in U. S. & Pac. R. R. Exped. Fish.* p. 213, pl. 46. figs. 1–4.
—— frateculus, *Girard, l. c.* p. 215, pl. 45. figs. 1–4.

D. 10. A. 10. V. 10. L. lat. 74. L. transv. 15/13.

Head and body rather low and elongate; the height of the body is contained five times in the total length (without caudal), the length of the head four times and one-fourth. The width of the interorbital space (which is slightly convex) is equal to the length of the snout. Eye of moderate size, its diameter being one-half of the length of the snout, and one-third of that of the postorbital part of the head. Mouth horizontal, of moderate width, the maxillary not extending to the vertical from the front margin of the eye. Upper jaw overlapping the lower. Lips well developed. Suborbital bones narrow, the præorbital being longer than the eye and more than twice as large as the postorbital. The origin of the dorsal fin is nearly opposite to that of the ventral fin, and nearly midway between the end of the snout and the base of the caudal. Caudal fin forked. There are eight longitudinal series of scales between the lateral line and ventral fin. A narrow dark band (more or less conspicuous) runs along the middle of the side of the body.

Pharyngeal teeth 5 . 2—2 . 5, the lower stout, obtusely rounded at the top, molar-like; the two upper compressed, terminating in a hook; the inner small and conical. Gill-rakers short, small, distant, few in number, terminating in two or more irregular points. The attachment of the gill-membranes takes place opposite to the angle of the præoperculum.

Western North America.

a, b. Types of the species. Columbia River. From the Haslar Collection.

c. Adult. San Francisco. Presented by Dr. W. O. Ayres.

II. *Upper caudal lobe more developed than the lower.*

8. **Leucosomus inæquilobus.**

Pogonichthys inæquilobus, *Baird & Girard, Proc. Ac. Nat. Sc. Philad.* 1854, p. 136; *U. S. & Pac. R. R. Exped. Fish.* p. 245, pl. 56. figs. 1–4 (position of dorsal fin incorrect).

D. 11. A. 10. V. 10. L. lat. 59. L. transv. 10/10. Vert. 26/15.

The upper lobe of the caudal fin is considerably longer than the lower, and the rays at the upper part of its root are unusually developed. The height of the body is nearly equal to the length of the head, which is more than one-fifth of the total (without caudal). Head two-thirds as deep as long. The diameter of the eye is one-fifth of the length of the head. The width of the interorbital space, which is convex, is more than the length of the snout. Snout of moderate length, subconical. Mouth subhorizontal, of moderate width, the maxillary extending to the vertical from the front margin of the orbit; upper jaw overlapping the lower. Præorbital longer than deep, larger than the postorbital, which is wider than the other suborbital bones. The origin of the dorsal fin is slightly in advance of that of the ventrals, and nearly midway between the end of the snout and the root of the caudal. Caudal fin deeply forked. The pectoral fins terminate at a great distance from the ventrals. There are six longitudinal series of scales between the lateral line and ventral fin. Coloration uniform.

Pharyngeal teeth strongly compressed, hooked, 5 or 4 . 2—2 . 5. Gill-rakers moderately developed, acutely pointed, claw-like. The attachment of the gill-membranes to the isthmus takes place in advance of the angle of the præoperculum.

California.

a, b–c. Adult (11 inches long). San Francisco. Presented by Dr. W. O. Ayres.

d. Adult male: skeleton. San Francisco. Presented by Dr. W. O. Ayres.

The *skeleton* does not essentially differ from that of European Leucisci. The last caudal vertebræ with their apophyses are remarkably strong, to offer a support for the much-developed lobes of the caudal fin.

63. CHONDROSTOMA *.

Chondrostoma, *Agassiz, Mém. Soc. Hist. Nat. Neuchat.* i. 1835, p. 38.
Chondrostoma, Chondrochylus, *et* Chondrorhynchus, *Heckel.*

Scales of moderate size or small. Lateral line terminating in the median line of the depth of the tail. Dorsal fin short, with not more than nine branched rays, inserted above the root of the ventrals. Anal fin rather elongate, with ten or more rays. Mouth inferior, transverse, lower jaw with a cutting edge, covered with a brown horny layer. Barbels none. Gill-rakers short, fine; pseudobranchiæ. Pharyngeal teeth 5 or 6 or 7—7 or 6 or 5, knife-shaped, not denticulated. Peritoneum black.

Europe and Western Asia.

1. Chondrostoma nasus.

Nase; Näsling. Le Nez.
Nasus, *Gesner*, p. 170; *Aldrov.* v. c. 26. p. 610; *Willughby*, p. 254; *Artedi, Gen.* p. 5. no. 15; and *Synon.* p. 6. no. 9; *Marsigli, Danub. Pan.-Mys.* iv. tab. 3. figs. 1-2.
Cyprinus, sp., *Gronov. Zoophyl.* no. 332.
Cyprinus nasus, *L. Syst. Nat.* i. p. 530; *Bloch, Fische Deutschl.* p. 35, taf. 3; *Hartm. Helvet. Ichthyol.* p. 212; *Meidinger*, tab. 12; *Gronov. Syst.* ed. *Gray*, p. 185; *Pallas, Faun. Ross.-As.* iii. p. 304.
Chondrostoma nasus, *Agass. l. c.*; *Nordmann, in Demid. Voy. Russ. Mérid.* iii. p. 493; *Sélys-Longchamps, Faune Belg.* p. 204; *Cuv. & Val.* xvii. p. 384; *Günth. Fische des Neckars*, p. 99; *Rapp, Fische des Bodensee's*, p. 11; *Heckel & Kner, Süsswasserf.* p. 217; *Siebold, Süsswasserf.* p. 225; *Jeitteles, Fische d. March*, ii. 1864, p. 17; *Blanchard, Poiss. France*, p. 413.
Chondrostoma cærulescens, *Blanchard, l. c.* p. 416.
—— dermæi, *Blanchard, l. c.* p. 418.

D. 12. A. 13–14. L. lat. 57–62. L. transv. 9/9.
Vert. 27/21.

The height of the body is two-ninths or one-fourth of the total length (without caudal), the length of the head one-fifth or nearly one-fifth. Snout considerably projecting beyond the mouth, the cleft of which is nearly straight in a transverse line. Pharyngeal teeth (7) 6—6. Five longitudinal series of scales between the lateral line and ventral fin. Pectoral short, terminating at a great distance from the ventral, extending to the 14th or 16th scale of the lateral line.

Continent of Europe, north of the Alps.

a, b. Adult. Danube. From the Stuttgart Collection.
c–d. Adult and half-grown. Bavaria. Purchased of Dr. Gemminger.
e, f–g. Adult. Neckar. From the Stuttgart Collection.
h. Adult. Holland. Purchased.
i. Adult: skeleton. Neckar. From Dr. A. Günther's Collection.

On a *hybrid* between this species and *Leuciscus muticellus*, named *Chondrostoma rysela*, see p. 235.

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* 1. Cyprinus labeo. *Pallas*; see under *Capoëta*, p. 77.
2. Chondrostoma rhodanensis, *Blanchard, Poiss. France*, p. 420.—Rhone.

2. Chondrostoma soëtta.

Savetta.
Sueta, *Bellon. De Aquat.* p. 315.
Chondrostoma nasus, *Naccari, Ittiol. Adr.* p. 413; *De Filippi, Cenni,* p. 10.
—— soëtta (ryzela), *Bonap. Faun. Ital. Pesc.*
—— seva, *Cuv. & Val.* xvii. p. 396.
Chondrochylus nasicus (!), *Heckel, in Russegger's Reisen,* i. p. 1031, and ii. 3. p. 289 *.
Chondrostoma soëtta, *Heckel & Kner, Süsswasserf.* p. 221. fig. 128: *Canestrini, Archiv. Zool. Anat. etc.* iv. 1866, p. 122.

D. 12. A. 14–15. L. lat. 57–60. L. transv. 9/8. Vert. 44.

The height of the body is one-fourth or rather more than one-fourth of the total length (without caudal), the length of the head one-fifth. Snout not much projecting beyond the mouth, the cleft of which is somewhat arched. Pharyngeal teeth 7 or 6—6 or 7. Four and a half longitudinal series of scales between the lateral line and ventral fin. Pectoral fin of moderate length, two-thirds of the distance of its root from the ventral extending to the 18th scale of the lateral line.

Representing *Ch. nasus* in rivers south of the Alps.

a. Adult. Milan. Presented by Professor von Siebold.
b–c. Half-grown. River Ricka, Montenegro. From the Mila Museum.

3. Chondrostoma regium.

Chondrochilus regius, *Heckel, in Russegger's Reisen,* i. p. 1077, taf. 9. fig. 3.
Chondrostoma regia, *Heckel, l. c.* ii. 3. pp. 278, 289.

D. 12. A. 13–14. L. lat. 64–65. L. transv. 11/?.

The height of the body is contained four times and one-third in the total length (without caudal), the length of the head six times. Snout projecting beyond the mouth, the cleft of which is nearly straight in a transverse line. Pharyngeal teeth (6) 7—6. Pectoral short, its length being two-thirds of that of the head. (*Heck.*)

Rivers Orontes and Tigris.

4. Chondrostoma genei.

Chondrostoma genei, *Bonap. Faun. Ital. Pesc.*; *Heckel, Sitzgsber. Akad. Wiss. Wien,* ix. 1852, p. 377. figs. 7–11; *Heckel & Kner, Süsswasserf.* p. 220. figs. 126 & 127 (part.); *Siebold, Süsswasserf.* p. 230; *Canestrini, Archiv. Zool. Anat. etc.* iv. 1866, p. 124.
—— jaculum, *De Filippi, Cenni sui pesci d'aqua dolce,* 1844, p. 11.

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* Heckel himself withdraws this genus and species, but he thinks the specimen is identical with *Ch. genei.* However, it is described by him as having 14 anal rays and L. lat. 60, which shows that it ought to have been referred to *Ch. soëtta.* The way in which the species of *Chondrostoma* are treated by this author illustrates well the principles by which he was guided in his ichthyological attempts generally.

Chondrorhynchus soëtta (?), *Heckel in Russegger's Reisen*, i. 1031, & ii. 3. p. 289.

B. 11. A. 11. L. lat. 52–56. L. transv. 9/7. Vert. 42.

The height of the body is contained from four times and one-fourth to four times and two-thirds in the total length (without caudal), the length of the head five times. Snout not much projecting beyond the mouth, the cleft of which is subsemicircular. Pharyngeal teeth (6) 5—5. Four longitudinal series of scales between the lateral line and ventral fin. Pectoral fin short, extending to the 13th scale of the lateral line.

Northern Italy; River Rhone; (Upper Rhine ?).

a. Adult. Milan. Presented by Professor von Siebold.

5. Chondrostoma knerii.

Heckel, in Russegger's Reisen, i. p. 1030; *Sitzgsber. Ak. Wiss. Wien*, viii. 1852, p. 381, taf. 13; *Heckel & Kner, Süsswasserf.* p. 223. fig. 129.

Closely allied to *Ch. genei*.

D. 11. A. 12. L. lat. 52–54. L. transv. 9/6.

The height of the body is one-fourth of the total length (without caudal), the length of the head two-ninths. Snout not much projecting beyond the mouth, the cleft of which is subsemicircular. Pharyngeal teeth 6—6. Five longitudinal series of scales between the lateral line and ventral fin. Pectoral fins nearly as long as the head, extending to the seventeenth scale of the lateral line.

River Narenta (Dalmatia).

a–b. Adult. Narenta. From the Milan Museum.

Chondrostoma miegii, Steindachner, Sitzgsber. Ak. Wiss. Wien, 1866, liii. p. 202, and liv. tab. 3, from Spain, requires further comparison with *Ch. knerii* before it can be admitted as a distinct species; it appears to have shorter pectoral fins. The author says that it has the cleft of the mouth semicircular, representing it transversely straight in the figure.

Dr. Steindachner mentions (ibid.) a fish regarded by him as a *hybrid* between *Ch. miegii* and *Barbus grællsii*; see a note on this point, on *Barbus bocagii*, p. 92.

6. Chondrostoma polylepis.

Steindachner, in Sitzgsber. Ak. Wiss. Wien, liv. 1866, p. 19, tab. 6.

D. 11. A. 12. L. lat. 68–75. L. transv. 12/9.

The height of the body is about two-ninths of the total length (without caudal), the length of the head one-fifth. Snout considerably projecting beyond the mouth, the cleft of which is nearly straight transversely. Pharyngeal teeth 6 or 5—5. Four or five longitudinal series of scales between the lateral line and ventral fin. Pectoral fin of moderate length. Lateral line composed of a more or less distinct series of black dots.

Pyrenean peninsula.

a, b–d. Half-grown. Coimbra. Presented by Dr. B. du Bocage.
e–f. Young. Cintra. Presented by Dr. B. du Bocage.

On a supposed *hybrid* between this species and *Barbus bocagei,* see the latter species, p. 92; and on another with *Leuciscus arcasii,* p. 216.

Chondrostoma willkommii, Steindachner, *l. c.* p. 266, taf. 2, from the Guadiana and Guadalquivir, is most closely allied to *C. polylepis,* but distinguished by having pharyngeal teeth 6.6 or 7. L. lat. generally 64–66. L. transv. $\frac{10-11}{?}$.

7. Chondrostoma phoxinus.

Heckel, in Russegger's Reisen, i. p. 1031; *Sitzgsber. Ak. Wiss. Wien,* 1852, ix. p. 115, taf. 10; *Heckel & Kner, Süsswasserf.* p. 225. figs. 131, 132.

D. 11. A. 10–11. L. lat. 88–90. L. transv. 17/10.

The height of the body equals the length of the head, and is nearly two-ninths of the total (without caudal). Snout not much projecting beyond the mouth, the cleft of which is arched. Pharyngeal teeth 6.6. The length of the pectoral fins is four-fifths of that of the head. (*Heck.*)

Sign (Dalmatia); Livno (Bosnia).

64. ORTHODON.

Orthodon, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 182.

Scales very small, lateral line present, running along the middle of the side of the tail. Dorsal fin short, without spinous ray, commencing opposite to the ventrals; anal fin short. *The upper and lower basal rays of the large caudal fin are unusually developed.* Mouth anterior, crescentic; intermaxillaries protractile. *Lower jaw with a sharp anterior edge* and a slight knob on the symphysis, and with the labial folds developed laterally only. No barbel. Gill-rakers of moderate length, numerous, compressed, with the inner edge fringed. *Pseudobranchiæ none.* The attachment of the gill-membranes to the isthmus takes place opposite to the angle of the præoperculum. *Pharyngeal bones with the upper limb very broad and concave, separated by a deep notch from the dentigerous portion.* Pharyngeal teeth strongly compressed, lancet-shaped, 6 or 5—6 or 5. Peritoneum black. Intestinal tract with numerous convolutions.

California.

1. Orthodon microlepidotus.

Gila microlepidota, *Ayres, Proc. Calif. Acad. Nat. Sc.* i. 1855, p. 21.
Orthodon microlepidotus, *Girard, U. S. & Pac. R. R. Exped. Fish.* p. 237, pl. 53. figs. 1–4.

D. 12. A. 10. V. 10–11. L. lat. 105–110. Vert. 24/20.

The height of the body is two-ninths of the total length (without caudal), the length of the head one-fourth. Snout very broad, of moderate length. Eye rather small, its diameter being one-half of the length of the snout, one-fourth of that of the postorbital portion of the head, and two-sevenths of the width of the interorbital space, which is convex. Præorbital nearly twice as long as deep, and longer than the orbit; the other suborbital bones narrow. Mouth somewhat oblique, with the upper jaw scarcely overlapping the lower, very broad; but the maxillary terminates far in advance of the orbit. Origin of the dorsal fin nearer to the root of the caudal than to the end of the snout, a little in advance of the origin of the ventrals. Coloration uniform.

California.

a, b, c. Adult (11–12 inches long). River San Joaquin. Presented by Dr. W. O. Ayres.

d. Adult male: skeleton. River San Joaquin. Presented by Dr. W. O. Ayres.

The intestinal tract is very narrow, and about seven times as long as the entire fish.

65. ACROCHILUS.

Acrocheilus, *Agassiz, Sillim. Journ.* xix. 1855, p. 96.

Scales? Lateral line running along the median line of the depth of the tail. Dorsal fin short, with ten branched rays, inserted above the root of the ventrals; anal fin with about eleven rays; *caudal fin remarkable for the many simple rays which it has along the base of its two lobes.* Mouth inferior, transverse, lower jaw with a cutting edge covered with a deciduous brown horny layer; a similar transverse bony plate along the inner edge of the intermaxillary bone. Barbels none. Pharyngeal teeth 5—4. club-shaped, not denticulated, terminating in a hook, with the inner (grinding) surface obliquely cut. Peritoneum black.

Columbia River.

1. Acrochilus alutaceus.

Acrocheilus alutaceus, *Agass. & Pick. Sillim. Journ.* xix. 1855, p. 99.

No specific description has been given of this fish.

Ninth Group. RHODEINA.

Anal fin of moderate length, with from nine to twelve branched rays, extending forwards to below the dorsal. Dorsal fin short or of moderate length. Lateral line, if complete, running along or nearly in the middle of the tail. Mouth with very small, or without any barbels. Pharyngeal teeth in a single series.

66. ACHILOGNATHUS.

Acheilognathus, *Bleek. Prodr. Cypr.* p. 228.

Acheilognathus *et* Paracheilognathus, *Bleek. Atl. Ichthyol. Cypr.* p. 33.

Scales of moderate size; lateral line complete. Dorsal fin extending from the ventrals to beyond the origin of the anal; anal fin rather elongate, with about twelve rays. Mouth anterior or subinferior, small, arched; lower jaw without or with only a lateral labial fold. Barbels none or two, small. Gill-rakers very short; pseudobranchiæ. Pharyngeal teeth 5—5, compressed, the bevelled surface with a simple groove.

China; Japan; Formosa.

1. Achilognathus himantegus.

D. 11. A. 13–14. L. lat. 34. L. transv. 6/4.

Very similar to *Rhodeus amarus*.

Barbels nearly as long as the eye. The height of the body is contained from twice and two-thirds to thrice in the total length (without caudal), the length of the head nearly five times. Snout obtuse, shorter than the eye, the diameter of which is one-third of the length of the head, and less than the width of the interorbital space. Mouth small, subinferior; lower jaw with a sharpish margin. The dorsal fin commences in the middle of the distance between the end of the snout and the root of the caudal, behind the ventrals; its last ray is opposite to about the fifth of the anal fin. Caudal fin emarginate; the pectoral fin extends to the root of the ventral. The lateral line is strongly curved downwards on the trunk. There are three longitudinal series of scales between the lateral line and the root of the ventral fin. Sides silvery; the pouches of the cutis for the scales brownish; a dark-bluish stripe runs along the middle of the tail, and terminates in a black band-like spot between the middle caudal rays; a series of blackish dots across the lower half of the dorsal fin.

Pharyngeal teeth compressed, uncinate, not serrated.

The females are provided, during the spawning-season, with a long external urogenital tube, as in *Rhodeus amarus*.

Island of Formosa.

a–d. Adult females, 3 inches long. From Consul Swinhoe's Collection.

2. Achilognathus limbatus.

Capoëta limbata, *Schleg. Faun. Japon. Poiss.* p. 203, tab. 100. fig. 5.
Acheilognathus limbatus, *Bleeker, l. c.* (name only).

D. 11. A. 13. L. lat. 35. L. transv. 5/6.

Barbels at least as long as the eye. The height of the body is contained twice and one-third in the total length (without caudal), the length of the head four times. The last dorsal ray is opposite to the middle of the anal fin. There are three longitudinal series of scales between the lateral line and ventral fin.

Japan.

a. Adult. From the Leyden Museum.

3. Achilognathus intermedius.

Capoëta intermedia, *Schleg. Faun. Japon. Poiss.* p. 203, tab. 100. fig. 4.
Acheilognathus intermedius, *Bleeker*, *l. c.* (name only).

D. 9 (?). A. 10 (?).

Barbels as long as the eye. The height of the body is contained twice and three-fifths in the total length (without caudal), the length of the head four times and one-half. The last dorsal ray is opposite to about the third of the anal fin. (*Schleg.*)

Japan.

4. Achilognathus melanogaster.

? Capoëta lanceolata, *Schleg. Faun. Japon. Poiss.* p. 202, pl. 100. fig. 3.
? Acheilognathus lanceolatus, *Bleek. Prodr. Cypr.* p. 225 (name only).
Acheilognathus melanogaster, *Bleek. Act. Soc. Sc. Indo-Neerl.* viii. *Japan*, vi. p. 92, tab. 2. fig. 1.

D. 12. A. 11. L. lat. 37. L. transv. $5\frac{1}{2}/6$.

Barbels nearly as long as the eye. The height of the body is one-third, or a little less than one-third, of the total length (without caudal), the length of the head one-fourth. The last dorsal ray is opposite to about the fifth of the anal fin. Pharyngeal teeth not serrated. There are four longitudinal series of scales between the lateral line and the root of the ventral fin. An indistinct bluish band along the side of the body; abdomen black.

Japan.

a. One of the typical specimens. Jeddo. From Dr. Bleeker's Collection.

5. Achilognathus imberbis.

D. 12. A. 12. L. lat. 35. L. transv. 6/5.

Barbels none. The height of the body is rather more than one-third of the total length (without caudal), the length of the head somewhat less than one-fourth. Snout rather shorter than the eye, the diameter of which is one-third of the length of the head, and less than the width of the interorbital space. Mouth small, oblique, anterior; lower jaw with a sharpish margin. The origin of the dorsal fin is nearer to the snout than to the caudal, immediately behind the root of the ventrals; its last ray is opposite to about the eighth of the anal; [it is elevated, with the upper margin convex, its last ray being longer than the base of the fin]. Caudal fin forked. The pectoral fin extends to the root of the ventral. The lateral line is but slightly curved downwards. There are three and a half longitudinal series of scales between the lateral line and the root of the ventral fin. Silvery, a bluish band along the middle of the side of the tail. Ventral and anal fins with well-defined yellowish-white outer margins.

Pharyngeal teeth uncinate, partially serrated.

China.

a. Adult male, $2\frac{2}{3}$ inches long. Purchased of Mr. Cuming.

6. Achilognathus rhombeus.

Capoëta rhombea, *Schleg. Faun. Japon. Poiss.* p. 205, pl. 100. fig. 6.
Acheilognathus rhombeus, *Bleeker, Cypr. Prodr.* p. 225 (name only).
Paracheilognathus rhombeus, *Bleeker, Atl. Ichthyol. Cypr.* p. 33 (name only).

D. 15–16. A. 12–13. L. lat. 37. L. transv. 6/7.

Barbels minute. The height of the body is two-fifths of the total length (without caudal). The last dorsal ray is opposite to the seventh of the anal fin. Pharyngeal teeth serrated. There are five longitudinal series of scales between the lateral line and the root of the ventral fin. A narrow bluish band along the side of the body.

Japan.

a. One of the typical specimens. From the Leyden Museum.

67. RHODEUS.

Rhodeus, *Agassiz, Mém. Soc. Hist. Nat. Neuchât.* 1835, i. p. 37.

Scales of moderate size; lateral line incomplete, only on the anterior part of the trunk. Dorsal fin with from nine to twelve branched rays, extending from the ventrals to beyond the origin of the anal. Anal fin rather elongate, with about twelve rays. Mouth subinferior, small, arched; lower jaw without labial fold. Barbels none. Gill-rakers very short; pseudobranchiæ. Pharyngeal teeth 5—5, compressed, not denticulated, the bevelled surface with a simple groove.

Male, during the spawning-season, with tubercles on the snout, and the female with a long external urogenital tube.

Central Europe; China.

1. Rhodeus amarus.

Der Bitterling. La Bouvière.
Duhamel, Pêches, ii. p. 514, pl. 26. fig. 5.
Cyprinus amarus, *Bloch, Fische Deutschl.* p. 52, tab. 8. fig. 3; *Cuv. & Val.* xvii. p. 79.
—— sericeus, *Pallas, Zoogr.* p. 320.
Rhodeus amarus, *Agassiz, Mém. Soc. Sc. Nat. Neuchâtel,* i. 1835, p. 37; or *in Wiegm. Arch.* 1838, p. 78; *Nordmann, in Demidoff Voy. Russ. Mérid.* iii. p. 481; *Sélys-Longchamps, Faun. Belge,* p. 201; *Heckel & Kner, Süsswasserf.* p. 100. figs. 52 & 53; *Krauss, in Würtemb. ntrw. Jahreshefte,* 1858, p. 115; *Fritsch, in Lotos, Zeitschrift etc.* ix. 1859, p. 201; *Siebold, Süsswasserf.* p. 116, pl. 1; *Dybowski, Cypr. Livland.* p. 83; *Jeitteles, Fische d. March,* ii. 1864, p. 3; *Jäckel, in Abhandl. zool.-mineral. Vereins z. Regensb.* 1864, p. 30; *Blanchard, Poiss. France,* p. 346.

D. 12. A. 12. L. lat. 34–38. L. transv. 10–12. Vert. 18/16–17.

The height of the body is, in males, rather less than one-third or three-eighths of the total length (without caudal), in females two-fifths, the length of the head a little less than one-fourth. The third suborbital bone is half as wide as the orbit. A bluish-silvery band along the middle of the tail.

Locally distributed over central Europe; found also in thermal springs.

a. Adult female. Holland. From Dr. Bleeker's Collection.
b. Numerous examples. Neckar. Presented by Dr. A. Günther.
c. Numerous examples. Neckar. From the Stuttgart Collection.
d. Numerous examples. River Würm (Bavaria). From Dr. Gemminger's Collection.
e–i. Adult. Olmütz. From Hr. Jeitteles's Collection.
k–l. Adult males: skeletons. Olmütz. From Hr. Jeitteles's Collection.

2. **Rhodeus sinensis.**

Very closely allied to the European species.

D. 12. A. 13. L. lat. 33. L. transv. 10.

The height of the body is two-fifths of the total length (without caudal), the length of the head a little less than one-fourth. Profile of the nape rather concave, that of the back very convex. The lateral line is visible on three scales only. The third suborbital is two-thirds as wide as the orbit. The dorsal fin commences behind the ventral, somewhat nearer to the caudal than to the end of the snout, and terminates above the middle of the anal. Anal with a narrow, intensely black edge. Tail with a bluish band along the middle, passing into blackish on the caudal fin.

China.

a–b. Females, 2½ inches long. Purchased of Mr. Cuming.
c. Male. Chikiang. Purchased of Mr. Fortune.

3. **Rhodeus ocellatus.**

Pseudoperilampus (?) ocellatus, *Kner, Novara, Fische,* p. 365, taf. 15. fig. 6.

D. 14. A. 14. L. lat. 33. L. transv. 11.

The height of the body is contained twice and one-third in the total length (without caudal), the length of the head four times and a half. Profile of the nape slightly concave, that of the back very convex. The lateral line is visible on about five scales. The third suborbital is scarcely more than half as wide as the orbit. The dorsal commences behind the ventral, somewhat nearer to the end of the snout than to the root of the caudal, and terminates opposite to the tenth ray of the anal. Coloration nearly uniform; a bluish band along the middle of the side of the tail.

China.

a. Two inches and two-thirds long. Purchased of Mr. Cuming.

68. PSEUDOPERILAMPUS.

Pseudoperilampus, *Bleeker, Versl. en Mededeel. Akad. Wet. Amsterd.* xv. p. 235; or *Nederl. Tydschr. Dierk.* i. p. 382.

Scales small; lateral line incomplete, only on the anterior part of the trunk. Dorsal fin elongate, with more than nine branched rays, extending from the ventrals to beyond the origin of the anal fin, which is rather elongate. Mouth anterior, small; lower jaw sharpish, without labial fold in front. Barbels none. Gill-rakers extremely short; pseudobranchiæ? Pharyngeal teeth 5—5, compressed, denticulated.

Japan.

1. Pseudoperilampus typus.

Bleeker, ll. cc.

D. 14. A. 14. L. lat. ca 65.

The height of the body is two-fifths of the total length (without caudal), the length of the head one-fourth. The origin of the dorsal fin is somewhat nearer to the root of the caudal than to the end of the snout, and its last ray is opposite to about the eleventh of the anal fin.

Japan.

a. Type of the species, 3 inches long; not in good state. From Dr. Bleeker's Collection.

Tenth Group. DANIONINA.

Anal fin of moderate length or elongate, with not less, and generally more, than eight branched rays. Lateral line running along the lower half of the tail. Mouth with small, or without any barbels. Abdomen not trenchant. Pharyngeal teeth in a triple or double series.

69. DANIO*.

Perilampus, sp., *M'Clell.*
Daniô (*Ham. Buch.*), sp., Paradanio et Devario, *Bleeker.*

Scales of moderate size. Lateral line running along the lower part of the tail. Dorsal fin elongate, with twelve or more rays, the posterior of which are opposite to the anal fin, which is composed of numerous rays. Mouth obliquely directed upwards, narrow. Barbels generally four, frequently two, or all rudimental or entirely absent. Suborbitals broad. Gill-rakers very short; pseudobranchiæ. Pharyngeal teeth 5.3.2—2.3.5, uncinate.

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* 1. Perilampus ostreographus, *M'Clell. Ind. Cypr.* pp. 289, 392, pl. 45. fig. 3. —Assam, Bengal.—D. 12. A. 16.—N.B. The numbers on this plate are erroneous; the text refers to it as pl. 45 and figs. 1, 2, 3, 4; whilst, in reality, the plate bears the number 56, and the figures are numbered 7, 8, 9, 10. Dr. Bleeker, not being aware of this, actually bestows new names on two of these figures (which, moreover, are very bad), Prodr. Cypr. p. 283, viz. *Devario cyanotænia* on *Perilampus ostreographus*, and *Devario macclellandi* on *P. devario*!

2. Leuciscus chrysops, *C. & V.* xvii. p. 308.—Bengal.—D. 13. A. 20. L. lat. 45.

3. Perilampus, affinis, *Blyth, Journ. As. Soc. Beng.* xxix. 1861, p. 27.—D. 13. A. 16.—Tenasserim.

4. —— macropodus, *Jerdon, Madr. Journ. Lit. & Sc.* 1849, xv. p. 325.—River Cavery.—D. 9. A. 21.

East-Indian continent and Ceylon.

1. Danio dangila.

Cyprinus dangila, *Ham. Buch. Fish. Gang.* p. 321.
Perilampus reticulatus, *M'Clell. Ind. Cypr.* pp. 290, 397, tab. 45. fig. 1.
Danio dangila, *Bleek. Atl. Ichthyol. Cypr.* p. 29 (name only).

D. 13. A. 17.

Caudal fin subtruncate. The height of the body is more than the length of the head, and two-sevenths of the total (without caudal). Four barbels, the lower being about as long as the head. Sides with reticulated narrow blue lines.

Rocky streams in Behar.

2. Danio lineolatus.

Leuciscus lineolatus, *Blyth, Journ. As. Soc. Beng.* 1859, May.

D. 14. A. 16. L. lat. 32–33. L. transv. $6\frac{1}{2}/3$.

Barbels four, the upper as long as the eye, the lower rudimental. The height of the body is contained thrice and one-third in the total length (without caudal), the length of the head four times. Sides of the body with three straight bluish bands, separated from each other by whitish lines, the middle dark band being the broadest, and running to the end of the middle caudal rays.

Sikkim.

a–c. From 2 to 3 inches long. Sikkim. From the Collection of Messrs. von Schlagintweit.

3. Danio micronema.

? Perilampus mysoricus, *Jerdon, Madr. Journ. Lit. & Sc.* 1849, xv. p. 325.
Danio lineolatus, *Bleek. Mém. Soc. Holl. Haarlem*, 1864, *Ceylon*, p. 19 tab. 4. fig. 3 (not *Blyth*).
—— micronema, *Bleek. l. c.* p. 21. fig. 2.

D. 12–14. A. 15–17. L. lat. 34–37. L. transv. $8\frac{1}{2}/3$.

Four barbels, the upper being scarcely half as long as the eye, whilst the lower are quite rudimental (and, probably, are sometimes entirely absent). The height of the body is contained from twice and three-fifths to thrice and a half in the total length (without caudal), the length of the head one-fourth. Sides of the body with straight bluish bands, the middle of which is broadest, more distinct on the tail than on the trunk, and extending to the end of the middle caudal rays.

Ceylon; Indian peninsula.

a. Fine specimen, 3 inches long. Southern Ceylon. Purchased of Mr. Cuming.

b, c, d–e, f–h. Adult and half-grown. Ceylon.

i–m. Fine specimens. Nilgherries. Purchased of Mr. Day (erroneously named by him "*Paradanio aurolineatus*").

n. Young. Northern India. Presented by Lieut.-Col. Playfair.

Dr. Bleeker, *l. c.*, distinguishes two species from Ceylon—an elevated form, *D. lineolatus,* with L. lat. 37 and A. 17–18, and an elongate form with L. lat. 34 and A. 15–16. These differential characters do not hold good, and happen to be exactly reversed in our specimens.

4. Danio alburnus

Chela alburna, *Heckel, Fische Kaschmir's,* p. 390, c. fig.

D. 13. A. 16. V. 9 L. lat. 37. L. transv. 7/?.

Barbels none (?). The length of the head is one-fifth of the total (without caudal), the height of the body two-sevenths. Cleft of the mouth not quite extending to below the nostrils. Coloration uniform. (*Heck.*)

Bombay.

5. Danio malabaricus.

Perilampus malabaricus, *Jerdon, Madr. Journ. Lit. & Sc.* xv. 1849, p. 325.
Perilampus aurolineatus, *Day, Proc. Zool. Soc.* 1865, p. 306.
Paradanio aurolineatus, *Bleeker, in Day's Fish. Malab.* p. 219, pl. 17. fig. 2.

D. 14. A. 18. L. lat. 34. L. transv. $8\frac{1}{2}/4$.

The upper barbels only are present, and half as long as the eye*. The height of the body is one-third, or rather more tham one-third, of the total length (without caudal), the length of the head one-fourth. Sides of the body with narrow, straight, bluish streaks; end of the tail and middle of caudal fin with a broad bluish longitudinal band.

Malabar.

a, b–c. Three of the typical specimens of *P. aurolineatus.* From the Collections of Dr. Bleeker and Surgeon Day.

6. Danio nilgherriensis.

Paradanio neilgherriensis, *Day, Proc. Zool. Soc.* 1867, p. 296.

D. 12–13. A. 13–14. L. lat. 35. L. transv. $\frac{6-7}{3}$.

The upper barbels only are present and quite rudimentary †. The height of the body is nearly equal to the length of the head, and one-fourth, or rather less than one-fourth, of the total (without caudal). A steel-blue band along the middle of the tail.

Nilgherries.

a–d. Four of the typical specimens. Purchased of Mr. Day.

* They have escaped the notice of Bleeker, who, consistently enough, at once formed a new generic name, *Paradanio*!

† They have been overlooked by Mr. Day—*Paradanio*!

7. Danio canarensis.

Perilampus canarensis, *Jerdon, Madr. Journ. Lit. & Sc.* 1849, xv. p. 325.

D. 15. A. 20.

Barbels? The length of the head is contained about four times and one-fourth in length of body, height rather more than twice and one-half in the same. Colour similar to that of *D. malabaricus*. (*Jerdon.*)

Canara.

8. Danio devario.

Cyprinus devario, *Ham. Buch. Fish. Gang.* pp. 341, 393, pl. 6. fig. 94.
Perilampus devario, *M'Clell. Ind. Cypr.* pp. 288, 391, pl. 45. fig. 2.
(Devario macclellandii, *Bleeker*; see p. 281, footnote.)

D. 18. A. 18. L. lat. ca 40.

Barbels apparently none. The height of the body is nearly one-half of the total length (without caudal). A dark stripe along the middle of the tail and caudal fin.

Bengal.

70. PTEROPSARION *.

Perilampus, sp., *M'Clell.*
Barilius, sp., *Day.*
Opsarius, sp., *Jerdon.*

Scales of moderate size. Lateral line running along the lower part of the tail. Dorsal fin elongate, with more than nine branched rays, the posterior of which are opposite to the anal fin, which is composed of numerous rays. Mouth obliquely directed upwards, wide, extending to below the orbit. Barbels none. Suborbitals entirely covering the cheek, the third being partly below the orbit. Gill-rakers very short; pseudobranchiæ. Pharyngeals 5 . 3 . 2—2 . 3 . 5, uncinate.

East-Indian continent.

1. Pteropsarion bakeri.

?-Opsarius malabaricus, *Jerdon, Madr. Journ. Lit. & Sc.* xv. 1849, p. 328.
Barilius bakeri, *Day, Proc. Zool. Soc.* 1865, p. 305; and *Fish. Malab.* p. 218, pl. 18.

D. 13. A. 16–17. L. lat. 38. L. transv. $8\frac{1}{2}/4\frac{1}{2}$.

The height of the body is contained thrice in the total length (without caudal). the length of the head thrice and three-fourths. The maxillary does not extend to below the centre of the orbit. The two last dorsal rays are above the anal. Two longitudinal series of scales between the lateral line and ventral fin. A series of bluish spots along the middle of the side of the body; basal half of the dorsal and anal, a band across the ventral, and one along each caudal lobe blackish.

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* ? 1. Opsarius canarensis, *Jerdon. Madr. Journ. Lit. & Sc.* xv. 1849, p. 328. —Canara.—D. 12. A. 14 L. lat. 36.

Hill-ranges of Travancore.

a. One of the typical specimens. From the Collection of Dr. Bleeker.

2. **Pteropsarion æquipinnatus.**

Perilampus æquipinnatus, *M'Clell. Ind. Cypr.* p. 393, tab. 60. fig. 1.

D. 13. A. 13. L. lat. 32.

Eight longitudinal series of scales between the ventral fins and the back. The height of the body is from one-third to one-fourth of the entire length. (*M'Clell.*)

Assam.

71. ASPIDOPARIA*

Aspidoparia, *Heckel, Blkr.*
? Morara, *Bleek. Prodr. Cypr.* p. 211.

Scales of moderate size, two or more longitudinal series of scales between the lateral line and the root of the ventral. Lateral line curved downwards, running along the lower part of the tail. Dorsal fin with seven or eight branched rays, commencing behind the origin of the ventrals, but not extending to above the anal. Anal fin elongate, with nine or more rays. Mouth inferior, small; barbels none; lower jaw without lip, with a sharp crescent-shaped margin. Suborbitals broad. Pharyngeal teeth 4 . 4 . 2—2 . 4 . 4 (in *Aspidoparia sardina*).

East-Indian continent.

1. **Aspidoparia sardina.**

Aspidoparia sardina, *Heckel, in Russegger's Reisen*, ii. 3. p. 288.

D. 9. A. 11. L. lat. 37. L. transv. 6/5.

Suborbitals covering the cheek. Two series of scales between the lateral line and ventral fin. The height of the body is one-fourth, the length of the head two-ninths of the total (without caudal). Pectoral fin at least as long as the head. Coloration uniform.

Assam; Bengal.

a–d. Four inches long. Soan River.

2. **Aspidoparia (?) morar.**

Cyprinus morar, *Ham. Buch. Fish. Gang.* pp. 264, 384, pl. 31. fig. 75; *Gray, Ind. Zool.* (cop. from *Ham. Buch.*).
? Leuciscus morar, *Bleek. Verh. Bat. Gen.* xxv. *Beng. & Hind.* p. 136.
? Morara morar (!), *Bleek. Prodr. Cypr.* p. 115.

D. 10. A. 12.

The height of the body is a little more than one-fourth of the total length (without caudal). Mouth inferior. Snout obtuse, scarcely as long as the eye. Pectoral fin shorter than the head. (*H. B.*)

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* ? 1. Perilampus elingulatus, *M'Clell. Journ. As. Soc.* vii. tab. 56. fig. 4; Leuciscus elingulatus, *M'Clell. Ind. Cypr.* pp. 294, 412, pl. 57. fig. 4.—Simla.—D. 9. A. 10. L. lat. 46.

Rivers Yamuna, Tista, Brahmaputra.

3. Aspidoparia (?) jaya.

Cyprinus jaya, *Ham. Buch. Fish. Gang.* pp. 333, 392.

D. 8. A. 9.

Scales of moderate size*. Snout projecting a little beyond the mouth, which is small and arched. Coloration uniform. (*H. B.*)

Northern Behar.

Leuciscus margarodes, M'Clell. Ind. Cypr. pp. 294, 411, is said to be probably identical with this species, but appears to have smaller scales, fifty-four in the lateral line; from Upper Assam. However, these fish are so insufficiently described, without any regard to important characters, that no reliance can be placed on the assertions of their authors concerning their affinities.

72. BARILIUS†.

Barilius, sp., *Ham. Buch.*
Opsarius, sp., *M'Clell. Ind. Cypr.* p. 295.
Leuciscus, sp., *Cuv. & Val.*
Pachystomus, sp., *et* Opsarius, sp., *Heckel, in Russegger's Reisen*, i. pp. 1038, 1043.
Opsarius, sp. (Shacra, sp., Opsarius, Bendilisis). *Bleek. Prodr. Cypr.* p. 287.
Barilius, sp. (Barilius, Bendilisis, Pachystomus), *Bleek. Atl. Ichthyol. Cypr.* p. 28.
Chedrus, (*Swains.*) *Bleek. l. c.* p. 31.
Opsaridium, *Peters, MS.*

Scales small, or of moderate size. Lateral line running along the lower part of the tail. Abdomen not compressed into an edge.

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* According to Hamilton's unpublished figure, which is 1⅗ inch long.

† 1. Cyprinus vagra, *Ham. Buch.* p. 269.—Patna.—Scales small. D. 9. A. 14. This, again, is a very doubtful species, resting on a drawing of Buchanan, published by M'Clelland, who bestowed on it the name of *Opsarius isocheilus*, Ind. Cypr. pp. 298, 421, tab. 56. fig. 1. It is difficult to explain his statement that there are only forty-two scales in the lateral line, as he does not appear to have had any materials beside those left by Buchanan.

2, 3, 4. Cyprinus hoalius, borelio, solio, *Ham. Buch. Fish. Gang.* pp. 336–337, from Bengal, are very insufficiently described, and will scarcely ever be recognized, no drawings having been left of them.

5. Opsarius piscatorius, *M'Clell. Calc. Journ. Nat. Hist.* ii. 1842, p. 582. "Back arched in front of the dorsal fin; anal inserted under the hinder part of the dorsal; mouth small; sides silvery, with nine transverse bars. D. 8. A. 8. Seharunpore. Very small."

? 6. Cyprinus chapalio, *H. B.* pp. 324, 390, from Bengal. If the description be correct, this fish belongs to another genus: the lateral line is said to be straight, high up on the side, and smooth; but the describer probably mistook the lateral line. Barbels two. A. 13.

Dorsal fin short, with less than nine branched rays, inserted distinctly behind the root of the ventrals. Anal fin elongate, with ten or more rays. Mouth anterior. Barbels four, two or none. The maxillary reaches to or below, but not behind the orbit. Suborbitals generally broad, the third never being narrower than the soft naked portion of the cheek, and partly situated below the orbit. Gill-rakers very short; pseudobranchiæ. Pharyngeal teeth 5.3 or 4.2 or 1—1 or 2.4 or 3.5, uncinate.

East-Indian continent; Nile; East Africa.

1. Barilius tileo.

Cyprinus tileo, *Ham. Buch. Fish. Gang.* p. 276.
Opsarius maculatus, *M'Clell. Ind. Cypr.* pp. 297, 417, tab. 47. fig. 4.
Barilius tileo, *Steindachner, Sitzgsber. Ak. Wiss. Wien*, 1867, lvi. p.

D. 10. A. 14. L. lat. 70. L. transv. 14/5.

Barbels none. The height of the body equals the length of the head, and is one-fourth of the total (without caudal). The maxillary extends beyond the vertical from the front margin of the orbit. The third suborbital bone is more than twice as broad as the soft naked part of the cheek. One or two irregular series of greenish spots along each side of the body.

Ganges; Brahmaputra.

a–b. Half-grown. Ganges. From M'Clelland's Collection.

Our knowledge of *Opsarius brachialis*, M'Clell. Ind. Cypr. pp. 297. 418, tab. 48. fig. 6, considered by M'Clelland himself to be only a variety of *O. tileo*, rests on the miserable figure given in the paper quoted.

2. Barilius radiolatus.

D. 10. A. 12. L. lat. 58. L. transv. 10/6.

A very small barbel at the upper end of the maxillary. The height of the body is nearly equal to the length of the head, which is contained four times and a half in the total (without caudal). Mouth obliquely descending backwards, of moderate width, the maxillary extending somewhat beyond the front margin of the eye. Jaws equal in length, the lower slightly projecting when the mouth is open. The diameter of the eye is equal to the length of the snout, rather less than the width of the interorbital space, and two-sevenths of the length of the head. The third suborbital bone is nearly contiguous with the præopercular ridge. Dorsal fin higher than long, its origin is midway between the eye and the root of the caudal; and its last ray is before the vertical from the anal fin. Caudal fin deeply forked. Pectoral not extending on to the ventral, shorter than the head; ventral reaching the vent. Pectoral process of the humerus very short. Scales with numerous very distinct radiating striæ. Silvery, back reddish.

Central India.

a. Several examples, 2½ inches long. Malva. From the Collection of Messrs. von Schlagintweit.

3. Barilius bendelisis.

Cyprinus bendelisis, *Buchanan, Journey in Mysore,* iii. p. 345, pl. 32; *Ham. Buch. Fish. Gang.* p. 270.
Opsarius bendelisis, *M'Clell. Ind. Cypr.* pp. 297, 418.

D. 9. A. 11. L. lat. 43. L. transv. 8/4.

Four very short barbels, those at the angle of the mouth being rather the longer*. The height of the body is a little more than the length of the head, and one-fourth of the total (without caudal). Mouth of moderate width, the maxillary scarcely extending beyond the front margin of the orbit. The third suborbital bone is thrice as broad as the soft naked portion of the cheek. Dorsal fin rather higher than long, terminating before the origin of the anal fin. A series of short bluish bars along the side of the back.

Mysore; Ganges.

a. Three inches long. Ganges. From M'Clelland's Collection.

4. Barilius cocsa.

Cyprinus chedra, *Ham. Buch. Fish. Gang.* p. 273; *Gray & Hardw. Ind. Zool.* (fig. not good); *M'Clell. Ind. Cypr.* p. 409.
—— tila, *Ham. Buch. l. c.* p. 274.
—— cocsa, *Ham. Buch. l. c.* p. 272, pl. 3. fig. 77.
Leuciscus cocsa, *M'Clell. l. c.* pp. 294, 411.
—— branchiatus, *M'Clell. l. c.* p. 293.
—— brachiatus, *M'Clell. l. c.* p. 409, pl. 42. fig. 5.
Cyprinus apiatus, *Valenc. in Jacquem. Voy. Ind. Atl.* pl. 15. fig. 3 (bad).
Leuciscus apiatus, *Cuv. & Val.* xvii. p. 356, pl. 510 (bad).
Chedrus cocsa, *Steindachner, Sitzgsber. Ak. Wiss. Wien,* 1867, lvi. p.

D. 9. A. 10. L. lat. 42. L. transv. 8½/5.

Humerus very broad, more or less produced into a long lancet-shaped process behind, the root of the pectoral being removed backwards to some distance from the gill-opening. Four minute barbels, the two upper of which are frequently absent. The height of the body is contained four times and one-third or four times and two-thirds in the total length (without caudal), the length of the head four times and one-fifth. Snout of moderate extent, in certain specimens with numerous small grooves (pores); the maxillary extends to the vertical from the front margin of the orbit. The third suborbital bone is as broad as the soft naked portion of the cheek. Dorsal fin higher than long, terminating in front of the anal. Back with indistinct blackish cross bars. Each scale with a small deep-black spot at the base; posterior margin of humerus black.

East-Indian continent.

a–f. Young. Simla. From the Collection of Messrs. von Schlagintweit.
g–h. Adult (6 inches long). Nepal. Presented by B. H. Hodgson, Esq.

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* The others were overlooked by Buchanan: genus *Bendelisis*, Blkr.!

i, k. Adult. From the Collection of the East-India Company.
l–p. Adult and young. Cossye River. Presented by Lieut. R. C. Beavan.
q–s. Adult skins. Seharunpore. From M'Clelland's Collection.
t. Half-grown. Ganges. From M'Clelland's Collection.
u. Half-grown. Calcutta. From the Collection of Messrs. v. Schlagintweit.
v. Half-grown. Nilgherries. Purchased of Mr. Day.

The humeral process is not always equally developed; it varies considerably in its extent backwards, and is constantly less developed in immature examples. This species has, like its congeners, the pharyngeal teeth in a triple series; therefore Bleeker's division "*Chedri*" is not only not founded in nature, but based on erroneous characters.

The spots on the scales are nearly constantly well marked, but the bars across the back are visible in well-preserved examples only.

Opsarius dualis, Jerdon, Madr. Journ. Lit. & Sc. xv. 1849, p. 330, from Coimbatoor and Palghat, appears to be very closely allied to the preceding species; but it is said to be without barbels, and the height of the body is contained thrice and two-thirds in its length.

5. Barilius alburnus.

D. 9. A. 13–14. L. lat. 42. L. transv. 8/4.

Two barbels, nearly half as long as the head, inserted at the upper end of the maxillary; sometimes another pair of minute barbels towards the lower end of the maxillary. The height of the body is two-elevenths of the total length (without caudal), the length of the head two-ninths or one-fifth. Mouth obliquely descending backwards, rather wide, the maxillary extending nearly to below the middle of the eye. Jaws equal in length, the lower slightly projecting when the mouth is open. The diameter of the eye is equal to, or rather more than, the length of the snout, less than the width of the interorbital space, and two-sevenths of the length of the head. The third suborbital bone is twice as wide as the soft naked portion of the cheek. Dorsal fin higher than long, its origin is midway between the eye and the root of the caudal; and its last two rays are above the front part of the anal fin. Caudal fin deeply forked. Pectoral not extending on to the ventral, shorter than the head; ventral reaching the vent. Pectoral process of the humerus very short. Twelve blackish cross bars descend from the back to the lateral line.

Nepal; Himalayas.

a–b. Four and a half inches long. From the Collection of the East-India Company.
c, d–e. Adult (5 inches) and half-grown. Nepal. Presented by B. H. Hodgson, Esq.
f–g. Adult. Sikkim. From the Collection of Messrs. von Schlagintweit.
h–i. Adult. India. Presented by Sir A. Smith.

6. Barilius morarensis.

D. 9. A 12. L. lat. 42. L. transv. $\frac{6\frac{1}{2}}{4\frac{1}{2}}$.

A very small barbel at the upper end of the maxillary. The height of the body is nearly equal to the length of the head, which is contained four times and one-third in the total (without caudal). Mouth obliquely descending backwards, of moderate width, the maxillary extending somewhat beyond the front margin of the eye. Jaws equal in length, the lower slightly projecting when the mouth is open. The diameter of the eye is rather less than the length of the snout, much less than the width of the interorbital space, and one-fourth of the length of the head. The third suborbital bone is nearly contiguous with the præopercular ridge. Dorsal fin higher than long, its origin is midway between the occiput and the root of the caudal; and its last ray is before the vertical from the anal fin. Caudal fin deeply forked; pectoral not extending on to the ventral, shorter than the head; ventral reaching the vent. Pectoral process of the humerus very short. Cross bars indistinct.

Gwalior.

a. Three inches long. Morar River. Presented by R. C. Beavan, Esq.

7. Barilius bicirratus.

Opsarius bicirratus, *M'Clell. Calc. Journ. Nat. Hist.* ii. 1842, p. 582.

D. 8. A. 12. L. lat. 35.

Two cirri; the length of the head equal to the height of the body; the dorsal is placed a little anterior to the anal. Nine incomplete bars on the sides. (*M'Cl.*)

Khyber Pass and Cabul River at Jellalabad.

8. Barilius barna.

Cyprinus barna, *Ham. Buch. Fish. Ganges*, p. 268.
Opsarius fasciatus, *M'Clell. Ind. Cypr.* pp. 296, 417, tab. 48. fig. 9.
? Opsarius latipinnatus, *M'Clell. l. c.* p. 298, tab. 48. fig. 7.
? Opsarius acanthopterus, *M'Clell. l. c.* p. 422.

D. 9. A. 13. L. lat. 42. L. transv. 9/4.

Barbels none. The height of the body is nearly equal to the length of the head, which is one-fourth of the total (without caudal). The maxillary extends somewhat beyond the vertical from the front margin of the orbit. The third suborbital bone is thrice as broad as the soft naked portion of the cheek. Dorsal fin longer than high, its three last rays being above the anal fin. Lower part of the humerus slightly dilated. Body with about eight narrow blackish vertical bands.

Ganges, Brahmaputra, and Jumna.

a. Ganges. From M'Clelland's Collection.
b. Kossye River. Presented by Lieut. R. C. Beavan.

9. Barilius barila.

Cyprinus barila, *Ham. Buch.* p. 267.
—— chedrio, *Ham. Buch.* p. 268.
Opsarius anisocheilus, *M'Clell. Ind. Cypr.* pp. 298, 422, tab. 48. fig. 8 (bad).

D. 9. A. 13. L. lat. 42. L. transv. $7\frac{1}{2}/4$.

Barbels none. The height of the body equals the length of the head, and is two-ninths of the total (without caudal). Snout somewhat pointed, with the jaws nearly even in front; the maxillary extends beyond the vertical from the front margin of the eye. The third suborbital bone is in contact with the præopercular ridge. Lower part of the humerus very slightly dilated. The last dorsal ray is opposite the first of the anal fin. Pectoral fins terminating at some distance from the root of the ventrals. Bright silvery, with about thirteen bluish cross bars along the side.

Northern Bengal.

a. Several specimens, $2\frac{1}{2}$ inches long. Kossye River. Presented by R. C. Beavan, Esq.

10. Barilius gatensis.

Leuciscus gatensis, *Cuv. & Val.* xvii. p. 309, pl. 503.
Opsarius gatensis, *Bleek. Prodr. Cypr.* p. 288 (name only).

D. 10. A. 17. L. lat. 38.

Barbels none. The height of the body is more than the length of the head, and contained thrice and one-third in the total (without caudal). The maxillary extends beyond the vertical from the front margin of the orbit. Cheek entirely covered by the suborbital ring. Sides of the back with about nine narrow dark cross bands. (*Val.*)

Peninsula of India.

11. Barilius rugosus.

Day, Proc. Zool. Soc. 1867, p. 294.

D. 10. A. 15–16. L. lat. 41. L. transv. $\frac{8\frac{1}{2}}{5\frac{1}{2}}$.

Barbels none. The height of the body is contained thrice and one-third in the total length (without caudal), the length of the head thrice and three-fourths. The maxillary extends beyond the vertical from the front margin of the orbit. The third suborbital bone is at least thrice as broad as the soft naked portion of the cheek; lower jaw slightly projecting beyond the upper. The last four dorsal rays above the anal fin; pectoral fins not extending to the ventrals. Lower part of the humerus not dilated. Sides of the back with about fifteen irregular bluish vertical bars. Dorsal fin blackish, white at the top; a blackish band along the middle of the anal fin.

Nilgherries.

a–c. Fine specimens. Purchased of F. Day, Esq.

This species may prove to be identical with *B. gatensis*, which was evidently described from examples preserved in spirits for some time.

12. Barilius rerio.

Cyprinus rerio, *Ham. Buch. Fish. Gang.* p. 323.
Perilampus striatus, *M'Clell. Ind. Cypr.* pp. 290, 397, pl. 46. fig. 1 (copied from *Buchanan's MS. drawing*).

D. 8. A. 17.

Barbels four, the upper of which are small, the lower somewhat longer than the head. The height of the body is nearly equal to the length of the head, and rather more than one-fourth of the total (without caudal). Lower jaw projecting beyond the upper. The lateral line is scarcely observable. Sides with eight or nine alternate longitudinal stripes of blue and silver; several similar stripes on the caudal and anal.

Bengal.

Neither the pharyngeal teeth nor the course of the lateral line of this species have been described.

13. Barilius zambezensis.

Opsaridium zambezense, *Peters, MS.*

D. 10. A. 13–14. L. lat. 41. L. transv. 7½/4.

Barbels none. The height of the body is a little less than the length of the head, which is contained four times and one-fourth in the total (without caudal). Mouth rather wide, the maxillary extending somewhat behind the front margin of the eye. The third suborbital bone is a little broader than the soft naked portion of the cheek. Dorsal fin not much higher than long, its last rays being above the front part of the anal. Pectoral process of the humerus not enlarged. Uniform silvery.

Zambezi.

a–c. Three of the typical specimens. Presented by Prof. Peters.

14. Barilius sardella.

D. 11. A. 13. L. lat. 48.

Barbels none. The height of the body is contained six times and a half in the total length (without caudal), the length of the head four times. Mouth of moderate width, the maxillary not extending to the vertical from the front margin of the orbit. Lower jaw projecting beyond the upper. Head twice as long as deep. Snout conical, pointed, much longer than the eye, the diameter of which is two-ninths of the length of the head. Suborbital ring much broader than the soft naked portion of the cheek. Origin of the dorsal fin nearer to the root of the caudal than to the gill-opening. Origin of the anal opposite to the fifth dorsal ray. Pectoral rather more than half as long as the head. Uniform silvery.

East Africa.

a. Two and two-thirds inches long. River Rovuma or Shire. Presented by Earl Russell.

15. Barilius niloticus.

Leuciscus niloticus, *De Joannis, in Guérin, Mag. Zool.* 1835, *Pisc.* pl. 3; *Cuv. & Val.* xvii. p. 311.
Opsarius thebensis, *Heckel, in Russegger's Reisen,* i. p. 1043 (name only).

D. 9. A. 13.

Scales large, eight in a transverse line. Barbels none. The length of the head is one-fourth of the total, the height of the body one-fifth. Mouth wide, extending to below the middle of the eye. Dorsal fin terminating in front of the anal. (*De J.*)

Thebes.

The same collector has described another similar fish under the name of *Leuciscus thebensis, l. c.* pl. 11, which would appear to differ from *L. niloticus* in having a deeper body, and nine or ten scales in a transverse line. He found it also at Thebes.

Leuciscus bibie, De Joannis, *l. c.* pl. 4, is another species from the Nile, which has not been rediscovered since it was first described. It is represented with the dorsal placed opposite to the anal fin, which has eighteen rays. Pectoral long.

Leuciscus gille, bisarre and *cir* are names given by Valenciennes (xvii. p. 353) to rude drawings of some Nile-fish.

73. BOLA.

Barilius, sp., *Ham. Buch., Bleeker.*
Opsarius, sp., *M'Clell., Bleeker.*

Scales small; lateral line running along the lower part of the tail. Dorsal fin short, with less than nine branched rays, opposite to the interspace between ventrals and anal. Anal fin elongate, with ten or more rays. Barbels none. Mouth very wide, extending behind the eye. Suborbitals very broad, especially the third, which is placed entirely behind the vertical from the hind margin of the orbit. Gill-rakers extremely short; pseudobranchiæ. Pharyngeal teeth 5 . 2—2 . 5, uncinate.

Ganges; Brahmaputra.

1. Bola goha.

Cyprinus bola, *Ham. Buch. Fish. Gang.* p. 274.
—— goha, *Ham. Buch. l. c.* p. 275; *Gray & Hardw. Ind. Zool.* c. fig.
Opsarius gracilis, *M'Clell. Ind. Cypr.* p. 419, pl. 47. fig. 1.
—— megastomus, *M'Clell. l. c.* p. 420, pl. 48. fig. 5.
Barilius goha, *Steindachner, Sitzgsber. Ak. Wiss. Wien,* 1867, lvi.

D. 10. A. 11–12. L. lat. ca 90.

The height of the body is contained five times in the total length (without caudal), the length of the head thrice and three-fourths. The diameter of the eye is two-thirds of the length of the snout, and two-elevenths of that of the head. Silvery, with series of irregular greenish spots along the side.

Bengal; Assam.

a. Five and a half inches long. Ganges. Presented by Dr. A. Günther.

b–e. Adult, half-grown, and young. Morar River, Gwalior. Presented by Lieut. R. C. Beavan.

f. Adult: stuffed.

Leuciscus salmoides, Blyth, Journ. As. Soc. Bengal, 1858 (1859), p. , from Allahabad, is described as "affined to *B. goha*, but larger and deeper in the body, with the spots smaller, much more numerous, and more regularly disposed, many of them occurring below the lateral line, and others on the opercula and præopercula; upper lip studded with pores. Lateral line composed of 88 to 90 scales; and oblique series of 26 scales descending from anterior base of dorsal. D. 10. A. 13."

74. SCHACRA*.

Opsarius, sp., *M'Clell.*

Scales small. Lateral line running immediately below the median line of the tail. Abdomen not compressed into an edge. Dorsal fin short, with less than nine branched rays, opposite to the space between ventrals and anal. Anal fin of moderate length, with at least ten rays. Mouth anterior, the upper jaw slightly overlapping the lower. The maxillary reaches to behind the front margin of the orbit. Barbels four. Suborbital ring of moderate width, the third being narrower than the soft naked portion of the cheek. Pharyngeal teeth 5 . 4—4 . 4, uncinate. Gill-rakers none. Pseudobranchiæ.

East-Indian continent.

1. Schacra cirrhata.

Cyprinus shacra, *Ham. Buch. Fish. Gang.* p. 271.

Opsarius cirratus, *M'Clell. Ind. Cypr.* pp. 296, 416, pl. 56. fig. 5 (bad copy from *Buchanan's original drawings*).

D. 9. A. 10. V. 8. L. lat. 72. L. transv. 12/10.

The height of the body is a little less than the length of the head, and two-ninths of the total (without caudal). Snout as long as the eye; the upper barbels are longer than the lower, which are as long as the eye. Humerus produced backwards into a process extending beyond the origin of the pectoral fin. The four outer pectoral rays are very strong, and connected by a very broad interradial membrane. Also the dorsal and anal rays are rather distant from one another. Origin of the dorsal fin nearer to the caudal than to the end of the snout. The first anal ray is inserted immediately behind the last of the dorsal fin. Caudal fin deeply forked. Silvery, with a series of about thirteen bluish spots along the side of the back.

Bengal; Assam.

a. Adult. Ganges. Presented by Dr. A. Günther.

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* Bleeker mentions a subgenus "*Shacra*" in his list of Cyprinoids, but not being acquainted with the type, he was unable to indicate one distinctive generic character.

75. OPSARIICHTHYS.

Opsariichthys *et* Barilius, sp., *Bleeker.*

Scales of moderate size or small. Lateral line running along the lower part of the tail. Dorsal fin short, with less than nine branched rays, inserted opposite to the root of the ventrals. Anal fin with ten or more rays. Barbels none. The maxillary reaches to or behind the front margin of the orbit. Suborbitals not dilated. Gill-rakers very short; pseudobranchiæ. Pharyngeal teeth 5.3.2 or 1—1 or 2.3.5, uncinate.

East-Asiatic islands.

1. Opsariichthys uncirostris.

Leuciscus uncirostris, *Schleg. Faun. Japon. Poiss.* p. 211, pl. 102. fig. 1.
Opsariichthys uncirostris, *Bleek. Atl. Ichthyol. Cypr.* p. 28 (name only).

D. 9. A. 12. L. lat. 50. L. transv. 11/8.

Mouth very wide, the maxillary extending to below the middle of the eye. Each intermaxillary with a strong prominence on each side near its upper end, fitting into a notch of the lower jaw. The height of the body is contained four times and two-thirds in the total length (without caudal), the length of the head thrice and two-fifths. The origin of the dorsal fin is midway between the end of the snout and the root of the caudal. None of the anal rays prolonged. Coloration uniform. (*Schleg.*)

Japan.

2. Opsariichthys sieboldii.

Leuciscus sieboldii, *Schleg. Faun. Japon. Poiss.* p. 211, pl. 101. fig. 5.

D. 9. A. 12. L. lat. 65. L. transv. 14/8.

Mouth rather wide, the maxillary scarcely extending beyond the vertical from the front margin of the eye. The front part of the anal fin is elongate, but scarcely reaches the root of the caudal if laid backwards. Pectoral fin not extending to the ventral. The height of the body is a little more than the length of the head, which is one-fourth of the total (without caudal.) Suborbital ring very narrow. Coloration uniform. (*Schleg.*)

Japan.

3. Opsariichthys temminckii.

Leuciscus temminckii, *Schleg. Faun. Japon. Poiss.* p. 210, pl. 101. fig. 4.

D. 9. A. 13. L. lat. 50. L. transv. 10/9.

Mouth rather wide, the maxillary extending somewhat beyond the vertical from the front margin of the eye. The four or five anterior branched anal rays are elongate (in adult specimens), extending to, or nearly to, the root of the caudal, if laid backwards. Pectoral fin not extending to the ventral. The height of the body is nearly equal to the length of the head, which is scarcely more than one-fourth of the total (without caudal). Suborbital ring very narrow, the middle bones being only one-third as broad as the orbit. (Snout with pores.) A dark band along the middle of the tail; vertical black streaks between the dorsal rays.

Japan.

a. Young. From the Leyden Museum.

4. Opsariichthys pachycephalus.

Closely allied to *O. temminckii*, but with the suborbitals considerably broader.

D. 10. A. 13. L. lat. 55. L. transv. 12/6.

Mouth rather wide, the maxillary extending somewhat beyond the vertical from the front margin of the eye. Snout longer than the eye, which is two-ninths or one-fifth of the length of the head. The four or five anterior branched anal rays are elongate, extending to, or nearly to, the root of the caudal, if laid backwards; dorsal fin rather small, its origin being opposite to the root of the ventral, and somewhat nearer to the root of the caudal than to the end of the snout. Caudal fin deeply forked. Pectoral not extending to the ventral. The length of the head is contained from thrice and a half to thrice and three-fourths in the total length (without caudal), the height of the body from thrice and three-fourths to four times and a half. Suborbital ring of moderate width, the second and third bones being half, or more than half, as broad as the orbit. Snout without grooves or pores. Four longitudinal series of scales between the lateral line and ventral fin. Coloration uniform silvery; a vertical black streak on each interspace between the dorsal rays. (Pharyngeal teeth 5 . 3 . 1—1 . 3 . 5.)

Formosa.

a. Adult, 5½ inches long. From Consul Swinhoe's Collection.
b–e. Half-grown. From Consul Swinhoe's Collection.

5. Opsariichthys platypus.

Leuciscus platypus, *Schleg. Faun. Jap. Poiss.* p. 207, pl. 101. fig. 1.
—— macropus, *Schleg. l. c.* p. 209, pl. 101. fig. 2.
—— minor, *Schleg. l. c.* p. 210, pl. 101. fig. 3.

D. 9. A. 12. L. lat. 42–44. L. transv. 9–10/6. Vert. 20/20.

Mouth of moderate width, the maxillary extending to the vertical from the front margin of the orbit. The four anterior branched anal rays are more or less prolonged, sometimes extending beyond the root of the caudal, if laid backwards. Also the pectoral is somewhat elongate in adult examples. The height of the body is nearly equal to the length of the head, which is contained four times and one-third in the total (without caudal). The origin of the dorsal fin is a little nearer to the end of the snout than to the root of the caudal. Suborbital ring very narrow. Body with about twelve more or less distinct bluish cross bands, which are broader than the interspaces between them. A vertical elongate black spot in each interspace between the anterior dorsal rays. Snout in certain adult specimens with round grooves (pores).

Japan; Formosa.

a. One of the typical specimens. Japan. From the Leyden Museum.
b. Adult. Japan. From Dr. Bleeker's Collection.
c. One of the typical specimens of *L. minor*. Japan. From the Leyden Museum.
d. Numerous adult and half-grown examples. Formosa. From Consul Swinhoe's Collection.
e. Adult: skeleton. Formosa. From Consul Swinhoe's Collection.

76. SQUALIOBARBUS.

Scales of moderate size; lateral line running along the lower part, but terminating in the middle, of the tail. Dorsal fin short, with less than nine branched rays, inserted opposite to the ventrals. Anal fin ten-rayed. A minute barbel at the corner of the mouth *. Mouth small, anterior, not extending backwards to the orbit. Suborbitals not dilated. Gill-rakers short, lanceolate, distant; pseudobranchiæ. Pharyngeal teeth 5 . 4 . 2—2 . 4 . 4. Peritoneum black.

China.

1. Squaliobarbus curriculus.

Leuciscus curriculus, *Richards. Ichth. Chin.* p. 299.
—— teretiusculus, *Basilewsky, Nouv. Mém. Soc. Nat. Mosc.* x. p. 232, tab. 4. fig. 1.
Rasbora teretiuscula, *Bleek. Ned. Tydschr. Dierk.* 1864, p. 26.
Sarcocheilichthys teretiusculus, *Kner, Novara, Fische*, p. 356.

D. 10. A. 11. V. 9. L. lat. 40–42. L. transv. 7/5½.

Very similar to *Leuciscus dobula* as regards general habit. There are two and a half longitudinal series of scales between the lateral line and the root of the ventral fin. Body slightly compressed, oblong; its depth is one-fourth of the total length (without caudal), and scarcely more than the length of the head. Snout of moderate length, longer than the eye, which is one-fifth of the length of the head. Interorbital space broad, slightly convex. Upper jaw slightly overlapping the lower. Barbels four, minute. Dorsal fin lower than the body; its origin is distinctly anterior to that of the ventral, and midway between the end of the snout and the root of the caudal. Anal fin not much deeper than long. Coloration uniform silvery.

China.

a. Typical specimen, 8½ inches long. Canton. Presented by J. R. Reeves, Esq.
b–c, *d–e*. Half-grown and young. China.

77. OCHETOBIUS.

Scales small; lateral line running along the lower part, but terminating in the middle, of the tail. Dorsal fin short, with ten (? nine) branched rays, inserted opposite to the ventrals, and not extending to above the anal, which is twelve-rayed. Barbels none. Mouth small, anterior, not extending to below the orbit. Sub-

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* Overlooked by Bleeker and Kner.

orbitals not dilated. Pseudobranchiæ. Pharyngeal teeth 5 . 3 . 2—2 . 3 . 5 (*dentes voratorii*).
China.

The fish for which I propose this genus appears to be closely allied to *Squaliobarbus,* to which I should have referred it but for the circumstance that Kner, who examined its intestines, does not mention the colour of the peritoneum, which he certainly would have done if it had been black as in *Squaliobarbus.* The absence of barbels would not form a generic character by itself.

1. Ochetobius elongatus.

Opsarius (?) elongatus, *Kner, Novara, Fische,* p. 358, taf. 15. fig. 1.

D. 2/10. A. 2/10. V. 10. L. lat. 68–70. L. transv. 9/?.

The height of the body is two-thirteenths of the total length (without caudal), the length of the head one-fifth. There are four longitudinal series of scales between the lateral line and ventral fin. Snout longer than the eye, which is one-fifth of the length of the head. Origin of the dorsal fin midway between the end of the snout and the root of the caudal fin, a little in advance of that of the ventrals. Coloration uniform. (*Kner.*)
Shanghai.

Eleventh Group. HYPOPHTHALMICHTHYINA.

Anal fin elongate. Lateral line running nearly along the median line of the tail. Mouth without barbels. Abdomen not trenchant. No dorsal spine. Pharyngeal teeth in a single series.

78. HYPOPHTHALMICHTHYS.

Hypophthalmichthys, *Bleeker, Prodr. Cypr.* p. 405.

Scales small. Lateral line running nearly along the middle of the side of the tail. Dorsal fin short, opposite to the interspace between ventrals and anal. Anal rays rather numerous. Barbels none. Mouth obliquely directed upwards, with very thin lips. Eye situated in the lower half of the head, its lower margin being below the level of the angle of the mouth. Suborbitals narrow. Gill-rakers very long, slender, lanceolate; pseudobranchiæ none. Gill-membranes united, forming a broad bridge across the isthmus, to which they are not attached. Pharyngeal teeth 4—4, not serrated, compressed in the longitudinal axis of the bone.
China.

1. Hypophthalmichthys molitrix.

Leuciscus molitrix, *Cuv. & Val.* xvii. p. 360: *Richards. Ichth. China,* p. 295.
—— hypophthalmus, (*Gray*) *Richards. Ichthyol. Voy. Sulph.* p. 139, pl. 63. fig. 1.

Cephalus mantschuricus, *Basilewsky, Nouv. Mém. Soc. Nat. Moscou*, x. 1855, p. 235, tab. 7. fig. 3.

D. 10. A. 17. L. lat. 115.

There are about fifteen longitudinal series of scales between the lateral line and the root of the ventral fin. The length of the head is nearly one-fourth of the total (without caudal). Mouth narrow, the diameter of the eye being about two-thirds of the length of the snout. Pectoral fin nearly equal in length to the postorbital part of the head.

China.

a. Stuffed, 15 inches long: type of *L. hypophthalmus*. Presented by J. R. Reeves, Esq.

2. Hypophthalmichthys nobilis.

Leuciscus nobilis, (*Gray*) *Richards. Ichthyol. Voy. Sulph.* p. 140, pl. 63. fig. 3; and *Ichthyol. China*, p. 295.
Cephalus hypophthalmus, *Steindachner*, *Verh. zool.-bot. Ges. Wien*, 1866, p. 383, taf. 3 (not synon.).
Hypophthalmichthys mandschuricus, *Kner, Novara, Fische*, p. 350 (not synon.).

D. 10. A. 16. L. lat. 115.

There are about seventeen longitudinal series of scales between the lateral line and the root of the ventral fin. The length of the head is scarcely one-third of the total (without caudal). Mouth wide, the diameter of the eye being less than one-half of the length of the snout. Pectoral fin longer than the postorbital part of the head.

China.

a. Stuffed, 14½ inches long: type of the species. Presented by J. R. Reeves, Esq.
b. Fine specimen. Amoy. From Consul Swinhoe's Collection.

Twelfth Group. ABRAMIDINA.

Anal fin elongate. Abdomen, or part of the abdomen, compressed.

79. ABRAMIS *

Abramis, *Cuv. Règne An.*
Abramis, Blicca, Bliccopsis, Ballerus, *et* Alburnus, sp., *Heckel, in Russegger's Reisen*, i. p. 1032.

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* 1. Cyprinus gibbosus, *Pall. Zoogr. Ross.-As.* iii. p. 324.—Russia.
2. Leuciscus parvulus, *C. & V.* xvii. p. 64, pl. 487*.—Crimea.—A. 21.
3. Abramis frivaldszkyi, *Heckel, in Russegger's Reisen*, i. p. 1032.—Brussa (Natolia).—A. 20–22. L. lat. 52–53. L. transv. 9/?.
4. Luxilus seco, *Girard, in Proc. Ac. Nat. Sc. Phil.* 1856, p. 203; *U. S. & Pac. R. R. Exp. Fish.* p. 281.—Rio Seco, Texas.—A. 16.
5. —— lucidus, *Girard, in Proc. Ac. Nat. Sc. Phil.* 1856, p. 203; and in

Stilbe, *Dekay, New York Faun. Fish.* p. 204.
Alburnellus, Luxilus, sp., Richardsonius, *Girard.*
Abramis, Abramidopsis, Blicca, Bliccopsis, *et* Alburnus, sp., *Siebold.*

Body much compressed, elevated or oblong. Scales of moderate size; lateral line present, running in the lower half of the tail. Dorsal fin short, without spine, opposite to the space between ventrals and anals; anal fin long, many-rayed. Lower jaw generally shorter, and rarely longer, than the upper; both jaws with simple lips, the lower labial fold being interrupted at the symphysis of the mandible. Upper jaw protractile. Gill-rakers rather short; pseudobranchiæ. The attachment of the branchial membrane to the isthmus takes place at some distance behind the vertical from the orbit. Pharyngeal teeth in one or two series, with a notch near the extremity. Belly behind the ventrals compressed into an edge, the scales not extending across it.

Europe, north of the Alps, and adjoining parts of Asia; North America.

a. Pharyngeal teeth 5—5: *Abramis* (Siebold), p. 300.
β. Pharyngeal teeth 5 . 2—2 . 5: *Blicca* (Heckel), p. 306.

a. Abramis.

1. Abramis brama.

The Bream. Der Brachsen or Bley.
Brax. La Brème.
Abramis fluviatilis, *Bellon. De Aquat.* p. 317; *Gesner,* pp. 316 & 317.
Cyprinus latus, *Rondel. De Pisc. Lac.* p. 154; *Aldrov. De Pisc.* pp. 641 & 642; *Schonev.* p. 33; *Gronov. Zoophyl.* no. 345.
Bream, *Willughby,* p. 248, tab. Q. 10. fig. 4; *Penn. Brit. Zool.* iii. p. 317, pl. 70, and, ed. 1812, iii. p. 478, pl. 81; *Couch, Fish. Brit. Isl.* iv. p. 36, pl. 187.
Brama, *Marsil. Danub.* iv. tab. 16 & 17.
Cyprinus, sp., *Artedi, Gen.* p. 6. no. 17; *Spec.* p. 20. no. 10; *Synon.* p. 4. no. 2.
Cyprinus brama, *L. Syst. Nat.* i. p. 531; *Leske, Ichth. Lips.* p. 73; *Bl. Fische Deutschl.* i. p. 75, taf. 13; *Bl. Schn.* p. 438; *Lacép.* v. p. 591; *Meidinger,* tab. 43; *Pall. Zoogr. Ross.-As.* iii. p. 325; *Ekström, Fische v. Mörkö,* p. 30; *Donovan, Brit. Fish.* iv. pl. 93; *Turton, Brit. Faun.* p. 108; *Jenyns, Manual,* p. 406; *Fries och Ekstr. Skand. Fisk.* p. 175, pl. 42; *Gronov. Syst.* ed. *Gray,* p. 180.
Brama, *Klein, Miss.* v. pl. 61. no. 1.

U. S. & Pac. R. R. Exped. Fish. p. 282, pl. 60. figs. 9–12.—Canadian River, South Fork.—A. 13.

6. Leuciscus compressus, (*Rafinesque*) *Kirtland, Bost. Journ. Nat. Hist.* iv. 1843, p. 306, pl. 15. fig. 2; *Storer, Mem. Amer. Acad.* ii. p. 409.—Ohio.—This species is described as having the abdomen compressed at the anal fin, which, however, is said to be nine-rayed. If this be so, it cannot be referred to the same genus as the other American species with a long anal fin. Is it, perhaps, a hybrid?

7. —— obesus, *Storer, Proc. Bost. Soc. Nat. Hist.* i. 1845, p. 48; and *Mem. Amer. Acad.* ii. p. 418; Stilbe obesus, *Agass. Sillim. Journ.* 1854, xix. p. 359 (name only); Luxilus obesus, *Girard, Proc. Ac. Nat. Sc. Philad.* 1856, p. 203 (synon. only), from Florence, Alabama, is very imperfectly known; not even the numbers of fin-rays are given

Abramis brama, *Fleming, Brit. An.* p. 187; *Agassiz, in Mém. Soc. Sc. Nat. Neuchâtel,* i. p. 39; or in *Wiegm. Arch.* 1838, p. 81; *Yarrell, Brit. Fish.* i. p. 335; 2nd edit. i. p. 382; 3rd edit. i. p. 397; *Nilsson, Skand. Faun.* iv. p. 324; *Nordmann, in Demid. Voy. Russ. Mérid.* iii. p. 503; *Sélys-Longchamps, Faune Belge,* p. 219; *Cuv. & Val.* xvii. p. 9; *Kröyer, Danm. Fisk.* iii. p. 369; *Günth. Fische d. Neckars,* p. 96; *Rapp, Fische d. Boodensee's,* p. 6; *Heckel & Kner, Süsswasserf.* p. 104. figs. 54 & 55; *Siebold, Süsswasserf.* p. 121; *Malmgren, Wiegm. Arch.* xxx. p. 311; *Dybowski, Cypr. Livl.* p. 190; *Jeitteles, Fische d. March,* i. 1863, p. 31; *Blanchard, Poiss. France,* p. 351.

Abramis vetula, *Heckel, Ann. Wien. Mus.* i. 1835, p. 230, taf. 20. fig. 6; and *Heck. & Kner, Süsswasserf.* p. 108. fig. 56; *Cuv. & Val.* xvii. p. 60.

—— microlepidotus, *Agassiz, l. c.*; *Cuv. & Val.* xvii. p. 43.

—— argyreus, *Agassiz, l. c.*; *Cuv. & Val.* xvii. p. 45.

—— gehini, *Blanchard, Poiss. France,* p. 355.

Osteology:—*Rosenthal, Ichthyot. Taf.* tab. 1–3.

Immature.

Faren.

Cyprinus, sp., *Artedi, Gen.* p. 3. no. 4; and *Spec.* p. 23. no. 12; and *Synon.* p. 13. no. 28.

Cyprinus farenus, *L. Syst. Nat.* p. 532; *Nilss. Prodr. Ichthyol. Scand.* p. 30; *Ekström, Fische Mörkö,* p. 40, tab. 3; *Siebold, in Wiegm. Arch.* 1836, p. 327; and *Preuss. Provinzial-Blätter, Königsberg,* 1837, p. 443; *Kröyer, in Wiegm. Archiv,* 1837, p. 393.

D. 12. A. 26–31. V. 10. L. lat. 51–57. L. transv. $\frac{12-13}{7\frac{1}{2}}$.
Vert. 21/22, 22/21, 23/21, 23/22.

Body elevated, its depth being contained from twice and a half to twice and three-fourths in the total length (without caudal; in young specimens it is somewhat less). Snout short, obtuse; mouth small, subinferior. The last dorsal ray is above the anterior anal rays.

Europe, north of the Alps and Pyrenees.

a–b. Adult. Ireland.
c. Many adult and half-grown specimens: skins. Loch Maben.
d–h. Adult and half-grown: skins. England.
i. Adult: stuffed. Thames. From the Collection of Sir A. Smith.
k. Adult. Lake of Ladoga.
l. Adult. Gefle. From Mr. Wheelwright's Collection
m–q. Half-grown. Gestrickland.
r–u. Young. Sweden.
v. Large specimen. Lake Wenern. From Mr. Lloyd's Collection.
w. Adult. Holland. From Dr. Bleeker's Collection.
x. Adult: skin. Holland. From Gronow's Collection.
y. Adult. Neckar. From the Stuttgart Collection.
z–α. Adult. Danube. From the Stuttgart Collection.
β, γ. Large specimens. Lake of Derkos. From Mr. Millingen's Collection.
δ. Adult: skeleton. Holland. Purchased of Mr. Damon.
ε. Adult: skull. Holland. Purchased of Mr. Damon.
ζ, η. Adult: skeletons. England. Purchased.
θ. Adult male: skeleton. Neckar. From the Stuttgart Collection.

ι. Adult female: skeleton. Lake of Derkos. From Mr. Millingen's Collection.
κ. Adult: skull. Holland. Purchased of Mr. Damon.

Hybrid.

On a hybrid between *A. brama* and *Leuciscus rutilus* (*Abramidopsis*), see p. 214.

2. Abramis ballerus.

Die Zope, Pleinzen. Faren (Sweden).
Cyprinus, sp., *Artedi, Gen.* p. 3. no. 5; and *Spec.* p. 23. no. 11 (not synon.).
Cyprinus ballerus, *L. Syst. Nat.* i. p. 532; *Bl. Fische Deutschl.* i. p. 62, taf. 9; *Pallas, Zoogr. Ross.-As.* iii. p. 327; *Fries & Ekstr. Skand. Fisk.* pl. 26, p. 112.
Abramis ballerus, *Cuv. & Val.* xvii. p. 45; *Nilss. Skand. Faun. Fisk.* p. 331; *Nordmann, in Demid. Voy. Russ. Mérid.* iii. p. 505; *Kröyer, Danm. Fisk.* iii. p. 411; *Heckel & Kner, Süsswasserf.* p. 113. fig. 59; *Dybowski, Cypr. Livl.* p. 196; *Siebold, Süsswasserf.* p. 130.

D. 11. A. 39–42. V. 10. L. lat. 69–73. L. transv. $\frac{15}{12}$.
Vert 22/26.

Body moderately elevated, its depth being one-third, or somewhat more than one-third, of the total length (without caudal). Snout obtuse, with the mouth terminal, obliquely ascending forwards. Back of the tail not keeled. Belly compressed behind the ventrals, the scales not extending across the edge. There are eight or nine longitudinal series of scales between the lateral line and ventral fin. End of the dorsal fin vertically above the anterior anal rays.

Germany; Holland; Sweden.

a. Fine specimen. Sweden. Presented by Prof. Lilljeborg.
b–g. Half-grown. Lake Wenern. From Mr. Lloyd's Collection.
h–k. Young. Sweden. From Mr. Wheelwright's Collection.
l. Adult. River Elbe. Presented by Prof. von Siebold.
m. Adult: skeleton. Sweden. From Mr. Wheelwright's Collection.

3. Abramis sapa.

Brama secunda, fœm., *Marsil. Danub.* tab. 17.
Cyprinus sapa, *Pall. Zoogr. Ross.-As.* iii. p. 328.
—— clavetza, *Güldenst. in Pallas, l. c.* p. 329.
Abramis schreibersii, *Heckel, Ann. Wien. Mus.* i. p. 227, tab. 20. fig. 4.
—— balleropsis, *Agassiz, Mém. Soc. Sc. Nat. Neuchât.* i. p. 39; or in *Wiegm. Arch.* 1838, p. 81.
—— sapa, *Nordmann, in Demid. Voy. Russ. Mérid.* iii. p. 506, tab. 21. fig. 2; *Heckel & Kner, Süsswasserf.* p. 115, fig. 60; *Jeitteles, Fische d. March*, i. 1863, p. 32; *Siebold, Süsswasserf.* p. 131.
Leuciscus sopa, *Cuv. & Val.* xvii. p. 49.

D. 11. A. 41–48. V. 10. L. lat. 50–52. L. transv. $\frac{9-10}{8}$.
Vert. 21/26.

Body moderately elevated, its depth being one-third, or somewhat more than one-third, of the total length (without caudal). Snout very obtuse, high, with the upper profile bent downwards in a strong curve. The upper jaw slightly overlaps the lower, the mouth being inferior. Back of the tail not keeled. There are six longitudinal series of scales between the lateral line and ventral fin. End of the dorsal fin vertically above the anterior anal rays.

Russia; Danube.

a. Fine specimen. Donauwörth. From the Stuttgart Collection.
b. Adult. Danube. From Dr. Gemminger's Collection.
c. Adult female: skeleton. Danube. From Dr. Gemminger's Collection.

4. **Abramis vimba.**

Die Russnase or Zärthe.
Capito anadromus, *Gesner, Hist. Anim.* p. 1269; and *Fischbuch*, p. 180; *Marsil. Danub.* tab. 6.
Cyprinus, sp., *Artedi, Gen.* p. 6. no. 16; and *Spec.* p. 18. no. 8; and *Synon.* p. 14. no. 32.
Cyprinus vimba, *L. Syst. Nat.* i. p. 531; *Bl. Fische Deutschl.* i. p. 38, tab. 4; *Meidinger*, tab. 38; *Reisinger, Ichth. Hong.* p. 72; *Pallas, Zoogr. Ross.-As.* p. 322; *Ekström, Vet. Akad. Handl.* 1830, p. 184; or *Fische v. Mörkö*, p. 49.
—— zerta, *Leske, Ichthyol. Lips.* p. 44.
—— carinatus, *Pall. Zoogr. Ross.-As.* iii. p. 323.
Abramis vimba, *Cuv. & Val.* xvii. p. 65; *Nilsson, Skand. Faun.* iv. p. 322; *Heckel & Kner, Süsswasserf.* p. 109. fig. 57; *Dybowski, Cypr. Livl.* p. 183; *Jeitteles, Fische d. March*, i. 1863, p. 29; *Siebold, Süsswasserf.* p. 125; *Malmgren, Wiegm. Arch.* xxx. p. 312; *Jäckel, Abhandl. zool.-miner. Ver. Regensb.* 1864, p. 34.
Abramis wimba, *Kröyer, Danm. Fisk.* iii. p. 400; *Nordmann, in Demid. Voy. Russ. Mérid.* iii. p. 508.

D. 11. A. 21–23. V. 10–11. L. lat. 55–60. L. transv. $10\frac{1}{2}/9$.
Vert. 23/23.

Body moderately high, its depth being one-third, or rather less than one-third, of the total length (without caudal). Snout produced, projecting beyond the mouth, which is entirely at the lower side of the snout. Back of the tail keeled; belly behind the ventrals compressed, the scales not extending across the edge. There are five longitudinal series of scales between the lateral line and the ventral. The anterior anal rays are at some distance behind the end of the dorsal fin.

Danube; North Germany; Sweden; Russia.

a–d. Half-grown. Olmütz. From Hr. Jeitteles's Collection.
e. Adult. Danube. Presented by Prof. von Siebold.
f. Half-grown. Berlin. Presented by Prof. Peters.
g. Adult: skin. From Gronow's Collection*.
h–m. Half-grown. Lake Wenern. From Mr. Lloyd's Collection.

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* Although *Gronow* had a specimen in his collection, he appears to have confounded this species with others (*A. ballerus* &c.), as is evident from his description and synonymy. Also *Klein* distinguished the species of *Abramis* badly, so that I cannot refer to this author in the synonymy.

n–o. Adult. Gestrickland. From Mr. Wheelwright's Collection.
p. Adult. Gefle. From Mr. Wheelwright's Collection.
q. Adult male: skeleton. Gefle. From Mr. Wheelwright's Collection.

Abramis tenellus, Nordmann, in Demid. Voy. Russ. Mérid. iii. p. 510 (Cuv. & Val. xvii. p. 63; Kessler, Bull. Soc. Nat. Mosc. 1859, xxxii. p. 529), appears to be closely allied to *A. vimba*, and its distinctive characters have not yet been sufficiently pointed out. A. 19–21. L. lat. 50–57. L. transv. 9/7. Pharyngeal teeth 5–5; from rivers near Inkermann. Kessler says that the snout is less prominent than in *A. vimba*, also that *Cyprinus persa*, Pallas, Zoogr. Ross.-As. iii. p. 310 (Eichwald, Faun. Casp. Caucas. p. 159, tab. 34. fig. 1; Cuv. & Val. xvii. p. 57; Rathke, Mém. Acad. St. Pétersb. iii. 1837, p. 344), is possibly the same fish.

5. **Abramis elongatus.**

Der Seerüssling.
Cyprinus vimba, *Agassiz, in Isis*, 1828, p. 1047; *Perty, in Isis*, 1832, p. 712 (not *L.*).
Abramis elongatus, *Agassiz, Mém. Soc. Sc. Nat. Neuchât.* i. p. 39; or *in Wiegm. Arch.* 1838, p. 81; *Cuv. & Val.* xvii. p. 75.
—— melanops, *Heckel, in Ann. Wien. Mus.* ii. 1840, p. 154, taf. 9. fig. 3; *Cuv. & Val.* xvii. p. 61: *Nordmann, in Demidoff, Voy. Russ. Mérid.* iii. p. 509, tab. 22. fig. 2; *Heckel & Kner, Süsswasserf.* p. 112. fig. 58; *Kessler, Bull. Soc. Nat. Mosc.* 1859, xxxii. p. 529; *Siebold, Süsswasserf.* p. 127; *Jäckel, Abhandl. zool.-miner. Ver. Regensb.* 1864, p. 35.
?? Abramis media, *Koch, Faun. Ratisbon.* p. 40.

D. 11. A. 20–22. V. 10–11. L. lat. 54–60. L. transv. $10\frac{1}{2}/7$. Vert. 23/23.

Body oblong, its depth being one-fourth, or a little less than one-fourth, of the total length (without caudal). Snout scarcely produced, slightly projecting beyond the mouth, which is entirely at the lower side of the snout. Back of the tail keeled. There are five longitudinal series of scales between the lateral line and the ventral. Anterior anal rays at some distance behind the end of the dorsal fin.

South-eastern and Northern Germany; Russia.

a. Adult. Donauwörth. From the Stuttgart Collection.
b, c–d. Adult and half-grown. River Amper (Bavaria). From Dr. Gemminger's Collection.
e–f. Adult. Würm-See (Bavaria). Presented by Prof. v. Siebold.
g. Adult female: skeleton. River Amper. From Dr. Gemminger's Collection.

Professor v. Siebold is inclined to regard this fish merely as a variety of *A. vimba*, representing specimens which, instead of descending to the sea as *A. vimba* annually does, remain stationary in the rivers. I find that also the skeletons of these two fishes are perfectly identical.

6. Abramis microlepis.

De Filippi, Viaggio in Persia, p. 358.

D. 12. A. 19. L. lat. 82. L. transv. 15/15.

The height of the body is one-third of the length. Lateral line "in medio corporis." (*De Fil.*)

River Kur.

7. Abramis americanus.

The Shiner.
Cyprinus americanus, *L. Syst. Nat.* i. p. 530; *Lacép.* v. pl. 15. fig. 4.
—— chrysoleucas, *Mitch. Trans. Lit. & Philos. Soc. New York*, i. p. 459.
Leuciscus chrysoleucas, *Storer, Report*, p. 88.
Stilbe chrysoleucas, *Dekay, Faun. New York, Fish.* p. 204, pl. 29. fig. 91.
Abramis versicolor, *Dekay, l. c.* p. 191, pl. 32. f. 103.
Leuciscus boscii, *Cuv. & Val.* xvii. p. 313, pl. 504.
—— americanus, *Storer, Mem. Amer. Acad.* ii. p. 408.
Leucosomus americanus, *Storer, l. c.* v. p. 283, pl. 21. fig. 2 (generic diagnosis erroneously copied from Heckel).
(Leucosomus chrysoleucas, *Heckel, in Russegger's Reisen*, i. p. 1042, is some other fish.)

D. 10. A. 16. V. 10. L. lat. 51. L. transv. $10\frac{1}{2}/6$.

Body somewhat elevated, its depth being about one-third of the total length (without caudal). Snout obtuse, with the mouth terminal, the jaws being even in front. Back not keeled. There are three longitudinal series of scales between the lateral line and ventral fin. The anal fin commences immediately behind the vertical from the last dorsal ray.

United States.

a. Adult. Massachusetts. Presented by Th. Moore, Esq.
b–d. Half-grown: skins. Ohio Canal. From Mr. Parnell's Collection.
e–g. Half-grown: skins. Lake Erie. From Mr. Parnell's Collection.
h–i. Young. United States. From Mr. Parnell's Collection.

8. Abramis occidentalis.

Leucosomus occidentalis, *Baird & Girard, Proc. Acad. Nat. Sc. Philad.* 1854, p. 137.
Luxilus occidentalis, *l. c.* 1856, p. 203; *U. S. & Pac. R. R. Exp. Fishes*, p. 280.

D. 13. A. 14.

The height of the body is one-fourth of the total length (with the caudal), the length of the head one-fifth. Snout subconical, rather tapering; cleft of the mouth oblique. Yellowish beneath, speckled with grey. (*Girard.*)

California.

9. Abramis (?) leptosomus.

Luxilus leptosomus, *Girard, in Proc. Acad. Nat. Sc. Philad.* 1856, p. 203; *U. S. & Mex. Bound. Ichthyol.* p. 60, pl. 19. figs. 9–12.

D. 9. A. 15.

The height of the body is nearly one-fourth of the total length (without caudal). Snout subconical. The anal fin commences behind the dorsal. (*Girard.*)

Dry creek, near Victoria, Texas.

β. *Blicca.*

10. Abramis blicca.

The White Bream, or Bream-Flat. Die Blicke or Der Güster. La Bordelière. Blicka, Bjelk or Bjerkna.
Ballerus, *Rondel.* ii. p. 154; *Schonev.* p. 28; *Aldrovand.* v. p. 645.
Blicca, Ballerus, Plestya, *Gesner*, p. 167.
Cyprinus, sp., *Artedi, Gen.* p. 3. no. 3; *Spec.* p. 20. no. 9; *Synon.* p. 13. no. 27 (add the synonymy of no. 24, p. 12).
Cyprinus björkna, *L. Syst. Nat.* p. 532.
—— plestya, *Leske, Ichth. Lips.* p. 69.
—— blicca, *Bl. Fische Deutschl.* i. p. 65, taf. 10; *Bl. Schn.* p. 437; *Hartmann, Helvet. Ichthyol.* p. 233; *Jenyns, Man.* p. 407; *Ekström, Fische v. Mörkö*, p. 44; *Fries och Ekstr. Skand. Fisk.* p. 64, tab. 12.
—— latus, *L. Gm.* i. p. 1438; *Jenyns, Catal. Brit. Vert.* p. 26; *Gronov. Syst.* ed. *Gray*, p. 179.
—— laskyr, *Pall. Zoogr. Ross.-As.* iii. p. 326.
—— ballerus, *Meidinger*, tab. 7 (not *L.*).
Abramis blicca, *Cuv. R. An.; Agassiz, in Mém. Soc. Sc. Nat. Neuchâtel*, i. p. 39; or *in Wiegm. Arch.* 1838, p. 81; *Nordmann, in Demid. Voy. Russ. Mérid.* iii. p. 504, pl. 22. fig. 1; *Sélys-Longch. Faun. Belge*, p. 218; *Kröyer, Danm. Fisk.* iii. p. 389; *Günth. Fische d. Neckars*, p. 93.
—— björkna, *Nilsson, Skand. Faun.* iv. p. 328; *Blanchard, Poiss. France*, p. 359.
—— micropteryx, *Agassiz, ll. cc.*; *Cuv. & Val.* xvii. p. 44.
—— erythropterus, *Agassiz, ll. cc.*; *Cuv. & Val.* xvii. p. 58.
White Bream, *Yarrell, Brit. Fish.* i. p. 340; 2nd edit. i. p. 387; 3rd edit. i. p. 403; *Couch, Fish. Brit. Isl.* iv. p. 40, pl. 198.
Abramis laskyr, *Nordmann, in Demidoff, Voy. Russ. Mérid.* iii. p. 504, tab. 22. fig. 1.
Leuciscus blicca, *Cuv. & Val.* xvii. p. 21.
Blicca argyroleuca, *Heckel & Kner, Süsswasserf.* p. 120. figs. 62 & 63; *Dybowski, Cypr. Livlands*, p. 202.
—— laskyr, *Heckel & Kner, l. c.* p. 123. fig. 64.
—— björkna, *Siebold, Süsswasserf.* p. 138; *Malmgren, Wiegm. Arch.* xxx. p. 313; *Jäckel, in Abh. zool.-miner. Ver. Regensb.* 1864, p. 38.

D. 11. A. 22–27. V. 9–10. L. lat. 43–48. L. transv. $\frac{9-10}{7}$.
Vert. 20/20.

Body elevated, its depth being contained from twice and one-fifth to twice and four-fifths in the total length (without caudal). Snout short, very obtuse, with the upper profile bent downwards in a strong curve. Upper jaw scarcely overlapping the lower; mouth small, inferior. Back of the tail without keel. There are five longitudinal series of scales between the lateral line and the ventral fin. Origin of the anal sometimes in the vertical from the end of the dorsal fin, sometimes a little in advance of or behind it.

Europe, north of the Alps.

a. Adult: skin. England. From Yarrell's Collection.
b. Young: stuffed. Loch Maben. From Mr. Parnell's Collection.
c. Half-grown. Munio River, Lapland. From Mr. Wheelwright's Collection.
d, *e–f*, *g–i*. Adult, half-grown, and young. Lake Wenern.
k. Adult: skin. Holland. From Gronow's Collection.
l. Adult. Holland. From Dr. Bleeker's Collection.
m. Adult. Holland. From Dr. Bleeker's Collection.—Named *Brama lugdunensis*, Blkr.
n. Adult. Berlin. Presented by Prof. Peters.
o. Adult. River Main. Presented by Dr. A. Günther.
p, *q*, *r–t*. Adult and half-grown. Danube.
u–x. Adult and half-grown. Switzerland. From the Collection of Prof. L. Agassiz.
y. Young. Lake Apollonia. Presented by H. Poole, Esq.
z. Adult male: skeleton. Lake Wenern. From Mr. Lloyd's Collection.
a. Adult female: skeleton. Danube. From the Stuttgart Collection.

Hybrids.

On a hybrid between this species and *Leuciscus rutilus*, see p. 215. On another with *Leuciscus erythrophthalmus*, p. 233.

11. Abramis bipunctatus.

Phoxinus primus, *Marsil. Danub. Pan.-Mys.* pl. 18. fig. 2.
Cyprinus bipunctatus, *Bloch*, *Fische Deutschl.* i. p. 50, taf. 8. fig. 1; *Hartmann*, *Helvet. Ichthyol.* p. 219; *Meidinger*, tab. 16; *Jurine*, *Mém. Soc. Phys. & Hist. Nat. Genèv.* iii. 1825, p. 226, pl. 14.
Aspius bipunctatus, *Agass. Mém. Soc. Sc. Nat. Neuchâtel*, i. p. 38 (name only); *Sélys-Longch. Faun. Belge*, p. 215; *Nordmann*, *in Demid. Voy. Russ. Mérid.* iii. p. 496.
Leuciscus bipunctatus, *Cuv. & Val.* xvii. p. 259.
—— baldneri, *Cuv. & Val.* xvii. p. 262, pl. 497.
Abramis bipunctatus, *Günth. Fische des Neckars*, p. 83.
Alburnus fasciatus, (?? *Nordmann*) *Jeitteles*, *Verh. zool.-bot. Ges. Wien*, 1862, p. 301, tab. 4. fig. 1; *Steindachner*, *Verh. zool.-bot. Ges. Wien*, 1863, p. 489.
—— bipunctatus, *Heckel & Kner*, *Süsswasserf.* p. 135. fig. 70; *Dybowski*, *Cypr. Livlands*, p. 161; *Siebold*, *Süsswasserf.* pp. 163 & 418; *Jeitteles*, *Verh. zool.-bot. Ges. Wien*, 1863, p. 3; and *Fische d. March*, ii. 1864, p. 7; *Blanchard*, *Poiss. France*, p. 371.
? Alburnus maculatus, *Kessler*, *in Bull. Soc. Nat. Mosc.* 1859, xxxii. p. 535.

D. 10–11. A. 17–20. V. 9–10. L. lat. 44–50. L. transv. $\frac{9-10}{3-4}$.
Vert. 38–40 (18/22).

Body moderately elongate, its depth being contained thrice and one-third or thrice and two-thirds in the total length (without caudal). Snout as long as, or a little shorter than, the eye; cleft of the mouth directed upwards, but the jaws are even in front. The scales on the hinder half of the abdomen do not extend across the edge. There are three and a half longitudinal series of scales between the lateral line and ventral fin. The origin of the anal is exactly opposite to the end of the dorsal. An indistinct shining band, composed of minute black dots, separates the silvery side from the darker-coloured back; each scale of the anterior half of the lateral line with a pair of black specks, each composed of minute dots.

Pharyngeal teeth 5 . 2—2 . 4 (5).

Central Europe.

a. Adult. Holland. From Dr. Bleeker's Collection.
b–d. Adult. River Main. Presented by Dr. A. Günther.
e. Many specimens. River Neckar. From the Stuttgart Collection.
f. Large specimen. River Neckar. Presented by Dr. A. Günther.
g–h. Large specimens. Lake of Zürich. Presented by Prof. v. Siebold.
i–k. Adult. Danube. Purchased of Dr. J. Heckel.
l–o. Adult. River Amper, Bavaria. From Dr. Gemminger's Collection.
p. Adult: skull. River Neckar. From Dr. A. Günther's Collection.

12. Abramis fasciatus.

Aspius fasciatus, *Nordmann, in Demid. Voy. Russ. Mérid.* iii. p. 497, pl. 23. fig. 2 (not *Jeitteles*).
Leuciscus fasciatus, *Cuv. & Val.* xvii. p. 252.
See *Siebold, Süsswasserf.* p. 418.

D. 10. A. 14. L. lat. 40–45. L. transv. 9/4.

Body moderately elevated, its depth being a little less than one-third of the total length (without caudal). Cleft of the mouth oblique, with the jaws nearly even in front. The origin of the anal is vertically below the end of the dorsal. Sides above and parallel to the lateral line with two blackish bands; each scale of the lateral line with two blackish dots.

Pharyngeal teeth 5 . 3 or 4—3 or 4 . 5.

Rivers of the countries east of the Black Sea.

13. Abramis cæruleus.

Alburnus cæruleus, *Heckel, in Russegger's Reisen*, i. p. 1084. taf. 11. fig. 3.

D. 11. A. 18–19. L. lat. 48–50. L. transv. 11/?.

Body rather elevated, its depth being one-third of the total length (without caudal). Snout a little shorter than the eye; cleft of the mouth directed upwards, with the jaws nearly even in front. There are four longitudinal series of scales between the lateral line and ventral fin. The origin of the anal fin is in advance of the vertical from the last dorsal ray. A greyish band along the side of the body. Vertical fins deep black towards their extremities. (*Heck.*)

Aleppo.

Although the structure of the branchial organs of this and the preceding species are not known, their affinity to *A. bipunctatus* is evident.

14. Abramis lateralis.

Richardsonius lateralis, *Girard, in Proc. Ac. Nat. Sc. Philad.* 1856, p. 202; or in *U.S. & Pac. R. R. Exp. Fish.* p. 279, pl. 60. figs. 5–8.

D. 12. A. 17.

Apparently allied to *A. balteatus.* The height of the body is contained thrice and two-thirds in the total length (without caudal). Jaws even in front; cleft of the mouth slightly oblique, anterior. Origin of the anal fin conspicuously in advance of the last dorsal ray. A blackish streak runs along the side, just above the lateral line and partly covering it. (*Gir.*)

Fort Steilacoom, Puget's Sound.

15. Abramis balteatus.

Cyprinus (Abramis) balteatus, *Richardson, Faun. Bor.-Amer. Fish.* p. 301.

Richardsonius balteatus, *Girard, in U.S. & Pac. R. R. Exp. Fish.* p. 278, pl. 60. figs. 1–4.

D. 11. A. 19–22. L. lat. 57. Vert. 40.

Body moderately elevated, its depth being contained thrice and one-third in the total length (without caudal). Snout rather short, conical, the lower jaw slightly projecting beyond the upper; mouth anterior. Back of the tail without keel. Origin of the anal fin vertically below the eighth dorsal ray. Coloration uniform.

Pharyngeal teeth 4 . 3 or 2—2 . 4 or 5.

Columbia River.

16. Abramis (?) oligaspis.

Alburnus oligaspis, *Cope, Proc. Ac. Nat. Sc. Philad.* 1864, p. 282.

D. 1/8. A. 1/14. V. 7. L. lat. 41. L. transv. 5/?.

Under jaw projecting a little beyond upper. Head conic in profile, with muzzle compressed, one-fifth of [total] length to notch of caudal. The diameter of the eye is contained thrice and one-fifth in the length of the head. Fins short, except anal. Two longitudinal series of scales between the lateral line and the root of the ventral. A broad silvery lateral band. (*Cope.*)

From Kansas; two inches long.

I do not know this species, but there is an example in the Liverpool Museum, sent by Professor Agassiz as "*Alburnus rubellus* from Lake Superior," which agrees in every point with the diagnosis of *A. oligaspis*, and not at all with the long description and figure of *A. rubellus* in 'Lake Superior,' p. 364. The shortness of the gill-rakers of that specimen (most probably identical with *A. oligaspis*) induces me to remove the species from *Abramis*. The lower jaw is described by Mr. Cope as projecting; but in the Liverpool example this is only the case when the mouth is opened.

Further, *A. oligaspis* agrees in many points with *Alburnellus dilectus*, Girard, in Proc. Ac. Nat. Sc. Philad. 1856, p. 193, and in U. S. & Pac. R. R. Exp. Fish. p. 259, pl. 57. figs. 9–12; and still better with *Alburnellus umbratilis*, Girard, P. A. N. Sc. Philad. *l. c.*; and in U. S. & Pac. R. R. Exp. Fish. p. 260,—both these fishes having been obtained in Arkansas. It is impossible to point out real specific differences without a reexamination of the typical examples.

Still more obscure are *Alburnellus amabilis*, Girard, Proc. Ac. Nat. Sc. Philad. 1856, p. 193; and U. S. & Mex. Bound. Ichthyol. p. 51, pl. 29. figs. 10–13, from Texas: *Alburnellus megalops*, Girard, *l. c.* 1°, & *l. c.* 2°, p. 52, pl. 29. figs. 1–4, from Texas; *Alburnellus socius*, Girard, *l. c.* 1°, & *l. c.* 2°, pl. 29. figs. 14–17, from Texas; *Alburnus lepidulus*, Girard, *l. c.* 1°, p. 212, from Black Warrior River, Alabama.

80. ASPIUS.

Aspius, sp., *Agassiz, Mém. Soc. Sc. Nat. Neuchâtel*, i. p. 38.

Body oblong; scales of moderate size; lateral line complete, terminating nearly in the middle of the depth of the tail. Dorsal fin short. without spine, opposite to the space between the ventrals and anal; anal fin elongate, with thirteen or more rays. Lower jaw more or less conspicuously projecting beyond the upper. Lips thin, simple, the lower labial fold being interrupted at the symphysis. upper jaw but little protractile. Gill-rakers short and widely set; pseudobranchiæ. The attachment of the branchial membrane to the isthmus takes place below the hind margin of the orbit. Pharyngeal teeth hooked, 5 . 3—3 or 2 . 5 or 4. Belly behind the ventrals compressed, the scales covering the edge.

Eastern Europe; Mesopotamia; China.

1. Aspius rapax.

Der Schied or Rapfen. Asp (Swed.).
Capito fluviatilis rapax, *Gesner, Paralip.* p. 9 *De Pisc.* pp. 169, 170; *Aldrov.* v. p. 604; *Willughby*, p. 256; *Schonev.* p. 30.
Rapax, *Schonev.* p. 30.
Cyprinus, sp., *Artedi, Genera,* p. 6. no. 19; *Spec.* p. 14. no. 6; *Synon.* p. 8. no. 12, and p. 14. no 31.
Marsil., Danub. Pan.-Mys. tab. 7. fig. 2.
Cyprinus aspius, *L. Syst. Nat.* i. p. 530; *Bl. Fische Deutschl.* i. p. 48, tab. 7; *Meidinger*, tab. 35.
—— rapax, *Leske, Ichthyol. Lips.* p. 56; *Pall. Zoogr. Ross.-As.* iii. p. 316.
Aspius rapax, *Agass. Mém. Soc. Sc. Nat. Neuchâtel*, i. p. 30 (name only); *Kröyer, Danm. Fisk.* iii. p. 500; *Nordm. in Demid. Voy. Russ. Mérid.* iii. p. 494; *Heckel & Kner, Süsswasserf.* p. 142; *Dybowski, Cypr. Livlands*, p. 173; *Siebold, Süsswasserf.* p. 169; *Jeitteles, Fische d. March*, ii. 1864, p. 9; *Malmgren, Wiegm. Arch.* xxx. p. 316.
Cyprinus tæniatus, *Eichwald, Zool. Spec.* iii. p. 102.
Abramis aspius, *Nilss. Skand. Faun.* iv. p. 334.
Leuciscus aspius, *Cuv. & Val.* xvii. p. 265.

Aspius vulgaris, *Leiblein, Corr. Blätt. zool.-miner. Ver. Regensb.* vii. 1853, p. 122.

D. 11. A. 17. V. 10. L. lat. 67–70. L. transv. $\frac{12-13}{6\frac{1}{2}}$. Vert. 49.

Cleft of the mouth wide. The commencement of the anal fin is behind the dorsal. Uniform silvery on the sides; males with rough excrescences on the scales during the spawning-season.

Europe east of the Rhine.

a. Fine specimen. Danube. From the Stuttgart Collection.
b. Adult: skull. Danube. From Dr. A. Günther's Collection.

2. Aspius vorax.

Aspius vorax, *Heckel, in Russegger's Reisen,* i. p. 1081, taf. 10. fig. 3.

D. 11. A. 13. L. lat. 94–105. L. transv. 18/10.

Cleft of the mouth wide, with the lower jaw much projecting beyond the upper. Eye small. The length of the head is one-fourth of the total (without caudal). The commencement of the anal fin is immediately behind the dorsal. The hindmost suborbital bone is nearly as large as the præorbital, the intermediate bones being narrow. Coloration uniform.

River Tigris.

a. Stuffed, 13 inches long. From the Collection of Commander Jones.

3. Aspius spilurus.

D. 9. A. 14. L. lat. 46. L. transv. 8/5.

The height of the body is two-ninths of the total length (without caudal), the length of the head one-fourth. Cleft of the mouth wide, the maxillary extending beyond the front margin of the eye. Snout pointed, with the lower jaw prominent, its symphysial knob received into a notch of the upper jaw. Eye as long as the snout, its diameter being contained thrice and one-third in the length of the head. Interorbital space flat, narrower than the orbit. Origin of the dorsal fin nearer to the root of the caudal than to the end of the snout; origin of the anal immediately behind the end of the dorsal. Caudal fin deeply forked, as long as the head. Pectorals extending somewhat beyond the root of the ventrals, which reach to the vent. A black spot on the base of the caudal.

Pharyngeal teeth 5 . 3—2 . 4.

China.

a–e. From 1½ to 2½ inches long. Inland mountainous region of Hongkong. Presented by J. C. Bowring, Esq.

81. ALBURNUS [*].

Alburnus, sp., *Heckel, in Russegger's Reisen*, i. p. 1036.

Body more or less elongate; scales of moderate size; lateral line present, running below the median line of the tail. Dorsal fin short, without spine, opposite to the space between ventrals and anal; anal fin elongate, with more than thirteen rays. Lower jaw more or less conspicuously projecting beyond the upper. Lips thin, simple, the lower labial fold being interrupted at the symphysis of the mandible. Upper jaw protractile. Gill-rakers slender, lanceolate, closely set; pseudobranchiæ. The attachment of the branchial membrane to the isthmus takes place below the hind margin of the orbit. Pharyngeal teeth in two series, hooked. Belly behind the ventrals compressed into an edge, the scales not extending across it.

Europe; Western Asia.

1. Alburnus lucidus.

The Bleak. Die Laube, or Uckelei. L'Ablette. Löja (Swed.).
Alburnus, *Auson.* v. 125; *Rondel. De Pisc. Fluv.* p. 208.
Phoxinus secundus, *Marsil. Danub. Pan.-Mys.* tab. 18. fig. 3.
Cyprinus, sp., *Artedi, Gen.* p. 6. no. 18; *Spec.* p. 17. no. 7; and *Synon.* p. 10. no. 19; *Gronov. Zoophyl.* p. 106. no. 336.
Cyprinus alburnus, *L. Syst. Nat.* i. p. 531; *Leske, Ichth. Lips.* p. 40; *Bl. Fische Deutschl.* i. p. 54, tab. 8. fig. 4; *Bl. Schn.* p. 437; *Lacép.* v. p. 589; *Hartmann. Helvet. Ichth.* p. 206; *Donov. Brit. Fish.* i. pl. 18; *Turton, Brit. Faun.* p. 106; *Jenyns, Manual*, p. 414; *Pall. Zoogr. Ross.-As.* iii. p. 321; *Meidinger*, tab. 30; *Fries och Ekstr. Skand. Fisk.* p. 203, tab. 51; *Gronov. Syst.* ed. *Gray*, p. 184.
Leuciscus, sp., *Klein, Pisc. Miss.* v. p. 68. no. 16, tab. 18. fig. 3 (bad).
Bleak, *Penn. Brit. Zool.* iii. p. 324, pl. 73; ed. 1812, iii. p. 487, pl. 84; *Couch, Fish. Brit. Isl.* iv. p. 56, pl. 195.
Able ordinaire, *Duhamel, Pêches*, ii. pl. 32. fig. 1.
Leuciscus alburnus, *Fleming, Brit. An.* p. 188; *Cuv. & Val.* xvii. p. 272; *Yarrell, Brit. Fish.* i. p. 368; 2nd edit. i. p. 419; 3rd edit. i. p. 438; *Rapp, Fische d. Bodensee's*, p. 9.
Aspius alburnus, *Agass. Mém. Soc. Sc. Nat. Neuchâtel*, i. p. 38; *Kröyer, Danm. Fisk.* iii. 1. p. 485; ? *Nordmann, in Demidoff, Voy. Russ. Mérid.* iii. p. 496.
Abramis alburnus, *Ekström, Fische v. Mörkö*, p. 53; *Nilss. Skand. Faun.* iv. p. 337; *Günth. Fische d. Neckars*, p. 86.
Aspius alburnoides, *Sélys-Longch. Faun. Belge*, p. 214; *Cuv. & Val.* xvii. p. 186.
Leuciscus ochrodon, *Cuv. & Val.* xvii. p. 249.
Alburnus lucidus, *Heck. & Kner, Süsswasserf.* p. 131. figs. 67 & 68; *Dybowski, Cypr. Livlands*, p. 165; *Siebold, Süsswasserf.* p. 154;

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[*] 1. Leuciscus cordilla, (*Savi*) *C. & V.* xvii. p. 291.—Italy.—A. 13. L. lat. 39.
2. —— albuloides, *C. & V.* xvii. p. 298.—Persia.—A. 13. L. lat. 40–45.
3. Alburnus doriæ, *De Filippi, Viagg. in Persia*, p. 360.—A. 12. L. lat. 53. From Schiraz.
4. Cyprinus tarichi, (*Güldenst.*) *Pall. Zoogr. Ross.-As.* iii. p. 335; *C & V.* xvii. p. 294.—Lake Gokcha.
5. Leuciscus vulturius, *Costa, Faun. Nap. Pesc.* p. 17, t. 15.—Lago di Monticchio.—A. 15.

Malmgren, in Wiegm. Arch. xxx. p. 315; *Jeitteles, Fische d. March,* ii. 1864, p. 6; *Blanchard, Poiss. France*, p. 364.
Alburnus breviceps, *Heck. & Kner, Süsswasserf.* p. 134. fig. 69.
—— fabræi, *Blanchard, Poiss. France*, p. 370.

D. 10–11. A. 19–23. V. 9–10. L. lat. 47–53. L. transv. $\frac{8-9}{4-3}$. Vert. $\frac{20-22}{22}$.

Body rather elongate. Snout as long as, or somewhat longer than, the eye; cleft of the mouth directed upwards, the point of the lower jaw slightly projecting beyond the upper. The scales on the hinder half of the abdomen do not extend across the edge. There are three longitudinal series of scales between the lateral line and ventral fin. The anterior anal rays are below the end of the dorsal fin. Uniform bright silvery.

Europe, north of the Alps.

a, b. Adult. Thames. From Yarrell's Collection.
c–e. Adult. Lake Wenern.
f–g. Adult and half-grown. Gefle. From Wheelwright's Collection.
h–k. Half-grown. Sweden. From Wheelwright's Collection.
l. Adult. Holland. From Dr. Bleeker's Collection.
m–o. Half-grown. Rhine, near Strassbourg. Presented by Professor v. Siebold.
p–w. Adult and half-grown. River Main. Presented by Dr. A. Günther.
x–y, z–α. Adult. Neckar, near Tübingen. From the Stuttgart Collection.
β. Large specimen. Switzerland. From Professor L. Agassiz's Collection.
γ. Adult. Danube. Purchased of Dr. J. Heckel.
δ–ε. Large specimens. River Amper. From Dr. Gemminger's Collection.
ζ. Adult: skull. River Neckar. From Dr. A. Günther's Collection.

Hybrids.

On a hybrid between this species and *Leuciscus cephalus*, see p. 223. On another with *Leuciscus erythrophthalmus* (*Alburnus rosenhaueri*), p. 233.

M. Blanchard (Poiss. France, p. 369) distinguishes the Bleak of the Lakes of Geneva and Bourget as a distinct species, *Alburnus mirandella*; he says that it has fifty-seven or fifty-eight scales in the lateral line.

2. **Alburnus alburnellus.**

Alborella, Avola.
Aspius alburnus, *Bonap. Faun. Ital. Pesci.*
—— alborella, *De Filippi, Cenni*, p. 16.
Leuciscus alburnellus. *Martens, in Wiegm. Archiv*, 1857, pp. 151, 179. tab. 9. fig. 6.

Alburnus alborella, *Heckel & Kner, Süsswasserf.* p. 137. fig. 71; *Canestrini, Archiv. p. la Zoologia*, iv. 1866, p. 84.
—— fracchia, *Heckel & Kner, l. c.* p. 138. fig. 72.

D. 10–11. A. 16–19. V. 9. L. lat. 44–48. L. transv. $\frac{7-8}{4}$.
Vert. 37–39.

This species is extremely similar to *A. lucidus*, with which it agrees, except in having generally fewer scales and anal rays, also a smaller number of vertebræ. It may be regarded as the southern, less developed form of *Alb. lucidus*.

Southern Europe.

a. Large specimen, 5 inches long: skin. Lago Maggiore. Presented by T. C. Eyton, Esq.
b, *c*, *d*. Many specimens. Lago di Garda. Collected by Dr. E. von Martens.
e–h. Adult. River Narenta. From the Milan Museum.
i–k. Adult. Lake Apollonia. Presented by H. Poole, Esq.

Alburnus fracchia of Heckel is regarded and described by Prof. Canestrini as *Alburnus alborella*, var. *lateristriga*, l. c. iii. p. 103, and iv. p. 87. It is distinguished by a rather indistinct greyish band along the side. Specimens have been obtained from Treviso, Bologna, and Modena. Prof. Canestrini considers it possible that it is a hybrid between *Alburnus alborella* and *Leucos aula*. *Leuciscus albidus*, Costa, Faun. Nap. Pesc. p. 16, t. 14, from the River Staffoli, an affluent of the Alento, with A. 14, may prove to be the same form.

A *hybrid* between this species and *Leuciscus ukliva* has been mentioned, p. 235.

3. Alburnus scoranza.

Scoranza.
Alburnus scoranza, *Heckel, Süsswasserf.* p. 138.

D. 11. A. 17. L. lat. 50–51. L. transv. 9–8/?.

The height of the body is somewhat more than the length of the head, which is contained five times and a half in the total (with the caudal). Snout rather shorter than the eye. The anal fin commences below the end of the dorsal. Four longitudinal series of scales between the lateral line and ventral fin. (*Heck.*)

Lake of Scutari.

a–e. Adult. From the Haslar Collection.
? *f–h*. Adult. River Rieka, Montenegro. From the Milan Museum. —These specimens have the body considerably more elongate than appears to be the case in the typical *A. scoranza*.

4. Alburnus chalcoides.

Chamaïka (when smoked).
Cyprinus chalcoides, *Güldenstädt, Nov. Comm. Petropol.* xvi. p. 540, tab. 16.
—— clupeoides, *Pall. Zoogr. Ross.-As.* iii. p. 333.

Aspius clupeoides, *Nordmann, in Demid. Voy. Russ. Mérid.* iii. p. 500, *Poiss.* pl. 24. fig. 2.
Leuciscus clupeoides, *Cuv. & Val.* xvii. p. 291.

D. 11. A. 18*. L. lat. 50. L. transv. 11/5.

Body moderately elongate, its depth being more than the length of the head, and one-fourth of the total (without caudal). Lower jaw projecting beyond the upper. The origin of the anal fin is immediately behind the end of the dorsal; pectorals well developed, not extending to the ventrals. Coloration uniform.

Rivers of Southern Russia and Northern Persia.

5. Alburnus eichwaldii.

Cyprinus alburnus, *Eichwald, Faun. Casp.-Caucas.* p. 159 (not *L.*).
Alburnus eichwaldii, *De Filippi, Viagg. in Persia,* p. 359.

D. 10. A. 15. L. lat. 50. L. transv. 11/7.

The height of the body is one-fourth of the total length (with the caudal). Snout pointed, with the lower jaw but slightly prominent. A dark band along the upper part of the side.

River Kur, near Tiflis.

This may prove to properly belong to *Abramis.*

6. Alburnus scoranzoides.

Alburnus scoranzoides, *Heckel, Süsswasserf.* p. 139.

A. 13–14. L. lat. 41–42. L. transv. 7½/?.

Three longitudinal series of scales between the lateral line and the ventral fin. The anal fin commences behind the vertical from the end of the dorsal. (*Heck.*)

Montenegro.

a. Adult, in bad state. River Ricka. From the Milan Museum.

7. Alburnus mento.

Die Mai-Renke.
Aspius mento, *Perty, in Isis,* 1832, p. 720; *Heckel, in Ann. Wien. Mus.* i. p. 225, taf. 19. fig. 3; *Nordmann, in Demid. Voy. Russ. Mérid.* iii. p. 495.
Leuciscus mento, *Cuv. & Val.* xvii. p. 271.
Alburnus mento, *Heckel & Kner, Süsswasserf.* p. 139. fig. 73; *Siebold, Süsswasserf.* p. 161.
—— mentoides, *Kessler, Bull. Soc. Nat. Mosc.* 1859, p. 531.

D. 11. A. 17–19. V. 9–10. L. lat. 65–68. L. transv. 11/7.
Vert. 24/20.

Body rather elongate, its depth being contained from four times and one-third to five times in the total length (without caudal). Snout as long as, or rather longer than, the eye; cleft of the mouth directed upwards, the lower jaw considerably projecting beyond the upper. The scales on the hinder part of the abdomen do not extend across the edge. There are four and a half longitudinal series of scales between the lateral line and ventral fin. The anterior anal rays are behind the vertical from the last dorsal ray. Coloration uniform.

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* This is the number stated by Valenciennes, and shown in the figure given by Nordmann; the latter author has $\frac{3}{17-21}$ in the formula of the text.

Lakes of Bavaria and Austria; rivers of the Crimea.

a–c. Fine adult examples. Würm-See, Bavaria. From Dr. Gemminger's Collection.
d. Adult. From the Collection of Prof. L. Agassiz.
e. Adult female: skeleton. Würm-See. From Dr. Gemminger's Collection.

8. **Alburnus caudimacula.**

Alburnus caudimacula, *Heckel, l. c.* ii. 3. p. 264.

D. 11. A. 15–16. L. lat. 60–63. L. transv. 11/?.

Body rather elongate, its depth being contained five times and a half in the total length (with the caudal). The diameter of the eye is two-sevenths of the length of the head. Cleft of the mouth directed upwards, the lower jaw slightly projecting beyond the upper. There are three longitudinal series of scales between the lateral line and ventral fin. The anterior anal rays are behind the vertical from the last dorsal ray. Pectorals extending to the root of the ventrals. A black spot at the base of the caudal; edge of the outer pectoral ray black. (*Heck.*)

River Kara (Persia).

9. **Alburnus pallidus.**

Alburnus pallidus, *Heckel, l. c.* i. p. 1086; and ii. 3. p. 233, taf. 17. fig. 4.

D. 11. A. 17. L. lat. 64. L. transv. 13/?.

Body rather elongate, its depth being contained thrice and three-fourths in the total length (without caudal). Cleft of the mouth directed upwards, the lower jaw scarcely projecting beyond the upper. There are four longitudinal series of scales between the lateral line and the ventral fin. The anterior anal rays are in advance of the vertical from the last dorsal ray. Pectorals extending nearly to the root of the ventrals. Coloration uniform. (*Heck.*)

Aleppo.

10. **Alburnus sellal.**

Alburnus sellal, *Heckel, in Russegger's Reisen,* i. p. 1082, taf. 11. fig. 1.

D. 10 (11). A. 14–16. L. lat. 73–80. L. transv. 14/?.

Body rather elongate, its depth being contained four times and three-fifths in the total length (without caudal). The diameter of the eye is three-fourths or two-thirds of the width of the interorbital space. Snout as long as the eye; cleft of the mouth directed upwards, the lower jaw projecting beyond the upper. There are five longitudinal series of scales between the lateral line and ventral fin. The anterior anal rays are behind the vertical from the last dorsal ray. Pectorals terminating at some distance from the root of the ventrals. Scales on the anterior part of the trunk with minute black dots at the base. (*Heck.*)

River Kueik (Aleppo).

Alburnus hebes, Heckel, *l. c.* ii. 3. p. 229, taf. 17. fig. 1, from the same locality, is probably identical with the preceding species; it was separated on account of the greater depth of its body, which is contained four times and one-sixth in the total length (without caudal); there are also only twelve longitudinal series of scales between the dorsal fin and lateral line.

Alburnus microlepis, Heckel, *l. c.* i. p. 1083, taf. 9. fig. 2, from the same locality, is a species not less doubtful; it is founded on a specimen with somewhat smaller scales on the back.

11. **Alburnus capito.**

Alburnus capito, *Heckel, l. c.* i. p. 1086; and ii. 3. p. 232, taf. 17. fig. 3.

D. 11. A. 14. L. lat. 67. L. transv. 11/?.

Body rather elongate, its depth being one-fifth of the total length (without caudal); the length of the head is contained four times and one-third in it. Snout rather shorter than the eye; cleft of the mouth directed upwards; the lower jaw projecting beyond the upper. There are five longitudinal series of scales between the lateral line and ventral fin. The anterior anal rays are behind the vertical from the last dorsal ray. Pectorals terminating at some distance from the root of the ventrals. (*Heckel.*)

Mountain-streams of Kurdistan.

12. **Alburnus iblis.**

? Leuciscus maxillaris, *Cuv. & Val.* xvii. p. 296, pl. 499.
Alburnus iblis, *Heckel, l. c.* ii. 3. p. 263.

D. 11. A. 15. L. lat. 72–75. L. transv. 12/?.

Body rather elongate, its depth being more than one-fifth of the total length (without caudal). The diameter of the eye equals the width of the interorbital space. Cleft of the mouth directed upwards, the lower jaw much projecting beyond the upper. There are four longitudinal series of scales between the lateral line and ventral fin. The anterior anal rays are behind the vertical from the last dorsal ray. Pectorals terminating at some distance from the root of the ventrals. Coloration uniform. (*Heck.*)

Persia (Araxes).

13. **Alburnus scheitan.**

Alburnus schejtan, *Heckel, l. c.* ii. 3. p. 264.

D. 11. A. 15. L. lat. 70–72. L. transv. 12/?.

Body rather elongate, its depth being one-fifth of the total length (with the caudal). The diameter of the eye equals the width of the interorbital space, and is two-sevenths of the length of the head. Cleft of the mouth directed upwards, the lower jaw slightly projecting beyond the upper. There are four longitudinal series of scales between the lateral line and the ventral fin. The anterior anal rays are behind the vertical from the last dorsal ray. Pectorals terminating at some distance from the root of the ventrals. A dark band along the side of the body, more distinct towards the tail than in front. (*Heck.*)

River Araxes.

14. Alburnus megacephalus.

Alburnus megacephalus, *Heckel, l. c.* ii. 3. p. 265.

D. 11. A. 15. L. lat. 71–74. L. transv. 11/?.

The height of the body is less than the length of the head, which is contained four times and one-third in the total (with the caudal). The diameter of the eye is one-fifth of the length of the head, and three-fourths of the width of the interorbital space. Cleft of the mouth directed upwards, the lower jaw much projecting beyond the upper. There are five longitudinal series of scales between the lateral line and ventral fin. The anterior anal rays are behind the vertical from the last dorsal ray. Pectorals not extending to the ventrals. Coloration uniform. (*Heck.*)

River Araxes.

15. Alburnus mossulensis.

Alburnus mossulensis, *Heckel, l. c.* i. p. 1086, and ii. 3. p. 230, taf. 17. fig. 2.

D. 11. A. 15. L. lat. 75–78. L. transv. 13/?.

Body rather elongate, its depth being contained four times and three-fourths in the total length (without caudal). Snout a little longer than the eye; cleft of the mouth directed upwards, the lower jaw projecting beyond the upper. There are five longitudinal series of scales between the lateral line and ventral fin. The anterior anal rays are behind the vertical from the last dorsal ray. Pectorals extending nearly to the root of the ventrals. A lead-coloured band runs along and above the lateral line. (*Heck.*)

River Tigris.

82. LEUCASPIUS.

Leucaspius *et* Squalius, sp., *Heckel.*
Leucaspius *et* Owsianka, *Dybowski.*
Leucaspius, *Siebold.*

Body compressed and rather elongate; scales of moderate size; lateral line incomplete, extending over a few scales only. Dorsal fin short, without spine, opposite to the space between ventrals and anal; anal fin elongate, with more than thirteen rays. Lower jaw projecting beyond the upper. Lips thin, simple, the lower labial fold being interrupted at the symphysis. Upper jaw protractile. Gill-rakers slender but short; pseudobranchiæ. The attachment of the branchial membrane to the isthmus takes place below the hind margin of the orbit. Pharyngeal teeth varying in number, sometimes in a single, sometimes in a double series, hooked. Belly behind the ventrals compressed into an edge.

South-eastern and Central Europe.

1. Leucaspius delineatus.

Squalius delineatus, *Heckel, in Russegger's Reisen,* i. p. 1041; *Heck. & Kner, Süsswasserf.* p. 193. fig. 107.
? Leuciscus stymphalicus, *Cuv. & Val.* xvii. p. 295, pl. 498.
Aspius owsianka, *Czernay, Bull. Soc. Nat. Mosc.* 1850, xxiii. p. 634, xxiv. p. 281, tab. 7, & p. 259; *Maslowski, ibid.* 1854, xxvii. p. 442; *Kessler, ibid.* 1856, xxix. p. 375; 1857, xxx. p. 473.
Leucaspius abruptus, *Heck. & Kner, Süsswasserf.* p. 145. fig. 76.
Owsianka czernayi, *Dybowski, Cyprin. Livl.* p. 146.
Leucaspius delineatus, *Siebold, Süsswasserf.* p. 172.

D. 11. A. 14–17. V. 9–10. L. lat 48. L. transv. 15.

The anal fin commences somewhat in advance of the vertical from the last dorsal ray. A silvery band along the side of body and tail.

South-eastern and Central Europe. Three inches long.

a–c. Adult. River Ocker, near Brunswick. Presented by Prof. von Siebold.

83. RASBORICHTHYS.

Rasborichthys, *Bleek. Prodr. Cypr.* p. 456.

Scales small; lateral line running along the middle of the tail. Dorsal fin with seven branched rays, situated above the space between ventrals and anal; anal many-rayed. Mouth oblique, anterior, narrow, not extending to below the eye, which is large, immediately below the upper profile, and provided with broad adipose eyelids. Barbels none. Suborbitals very narrow. Gill-rakers long, setiform, closely set; pseudobranchiæ. Pharyngeal teeth 5 . 3 . 1—1 . 3 . 5, knife-shaped.

Borneo.

1. Rasborichthys helfrichii.

Leuciscus helfrichii, *Bleek. Act. Soc. Sc. Neerl.* ii. *Borneo,* x. p. 15.
Rasborichthys helfrichii, *Bleek. Prodr. Cypr.* p. 456; or *Atl. Ichthyol. Cypr.* p. 128, tab. 22. fig. 3.

D. 9. A. 21. L. lat. 55. L. transv. 10/9.

Five series of scales between the lateral line and the ventral fins. The end of the dorsal fin is before the commencement of the anal. The height of the body is nearly equal to the length of the head, which is two-ninths of the total (without caudal). Coloration uniform, with an indistinct silvery band along the side.

Borneo.

a. One of the typical specimens. Kahajan. From Dr. Bleeker's Collection.

84. ELOPICHTHYS.

Elopichthys, *Bleeker, Cypr. Prodr.* p. 286 (diagnos. incorrect); *Nederl. Tydschr. Dierk.* 1865, p. 27.

Scales small; lateral line terminating in the middle of the depth of the tail. Dorsal fin with ten branched rays, placed somewhat behind the root of the ventrals; anal fin many-rayed. Mouth wide, oblique, extending to below the eye. The anterior part of the snout is formed by the greatly enlarged upper terminations of the intermaxillaries; maxillaries grown to the intermaxillaries and bent downwards beyond the lower end of the latter. Lower jaw with a very strong symphysial hook. Barbels none. Suborbital ring narrow. Pharyngeal teeth compressed, in three series. Postventral portion of the abdomen compressed.

China.

1. Elopichthys bambusa.

Leuciscus bambusa, *Richards. Voy. Sulph. Ichth.* p. 141, pl. 63. fig. 2; and *Ichth. Chin.* p. 299.

? Nasus dahuricus, *Basilewsky, Nouv. Mém. Soc. Nat. Mosc.* x. 1855, p. 234, tab. 7. fig. 1.

Elopichthys bambusa, *Bleek. l. c.*

Opsarius bambusa, *Kner, Novara, Fisch.* p. 357.

D. 13. A. 14. V. 10–11. L. lat. ca 100. L. transv. $\frac{20}{15}$.

Head and body much elongate, compressed; eye small; fins small, caudal deeply forked. There are nine longitudinal series of scales between the lateral line and ventral fin.

China.

a. Type of the species, 17 inches long, stuffed. Presented by J. R. Reeves, Esq.

85. PELOTROPHUS.

Pelotrophus, *Günth. Proc. Zool. Soc.* 1864, p. 314.

Body more or less elongate; scales of moderate or rather small size; lateral line running near to the lower profile. Dorsal fin with ten branched rays, without spine, situated nearer to the anal than to the ventrals; anal fin elongate, many-rayed, with the anterior part much elevated, whilst the posterior is very low, the two divisions being abruptly divided. Lower jaw more or less conspicuously projecting beyond the upper. Upper jaw protractile. Cheeks nearly entirely covered by the dilated suborbital ring. Pharyngeal teeth?

East Africa.

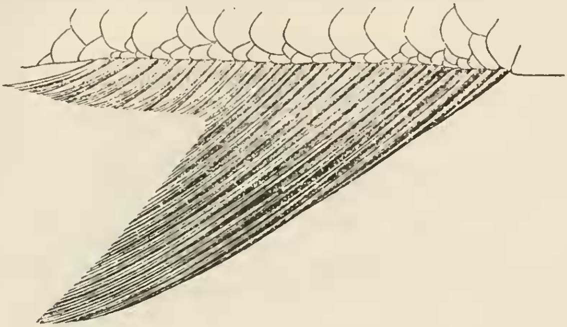
1. Pelotrophus microlepis.

Günth. l. c.

D. 13. A. 19–22. V. 10. L. lat. 88. L. transv. 14/10.

The height of the body is nearly equal to the length of the head, which is about two-ninths of the total (without caudal); the diameter of the eye is one-fifth (in young examples) or one-eighth (in old ones) of the length of the head, and about one-half of that of the snout.

Mouth oblique, wide, the maxillary extending beyond the vertical from the centre of the eye. Infraorbital bones very broad, especially the third, which is very large, although it does not quite reach the præopercular margin. The last dorsal ray is vertically above the origin of the anal fin. The last six or eight anal rays are short, only half as long as the ray preceding them. Caudal deeply forked. Pectoral long, shorter than the head, and not reaching the root of the ventrals. Scales thin, with numerous radiating striæ. There are six longitudinal series of scales between the lateral line and the root of the ventral fin. Uniform silvery.



Lake Nyassa.

a. Skin, 20 inches long, type of the species. Presented by Dr. Kirk.
b. Skin, young. Presented by Dr. Kirk.

2. Pelotrophus microcephalus.

Günth. l. c.

D. 13. A. 19. V. 9–10. L. lat. 47. L. transv. 9/5.

The height of the body is a little more than the length of the head, which is two-elevenths of the total (without caudal). The diameter of the eye is one-fifth (in young examples) or one-eighth (in old ones) of the length of the head, and about one-half of that of the snout. Mouth oblique, rather wide, the maxillary extending somewhat behind the vertical from the centre of the eye. Infraorbital bones not reaching the præopercular margin. The last dorsal ray is vertically above the anterior anal rays. The last six anal rays very short; caudal fin deeply forked. Pectoral fin of moderate length, nearly as long as the head, terminating at a great distance from the ventral. Scales rather thin, with numerous radiating striæ. There are two longitudinal series of scales between the lateral line and the root of the ventral fin. The cutaneous sheath of each scale blackish.

Lake Nyassa.

a. Skin, 15 inches long, type of the species. Presented by Dr. Kirk.
b–c. Skins, 11–14 inches long. Presented by Dr. Kirk.

86. ACANTHOBRAMA.

Acanthobrama, *Heckel, in Russegger's Reisen*, i. p. 1033.

Scales small; lateral line running nearly in the middle of the tail. Dorsal fin short, with the third ray enlarged, osseous, and smooth, inserted behind the ventrals. Anal fin many-rayed. Mouth anterior or subanterior. Barbels none. Pharyngeal teeth 5—5, compressed.

Western Asia.

1. Acanthobrama arrhada.

Heckel, l. c. ii. 3. p. 237, taf. 18. fig. 2.

D. 11. A. 19. V. 9. L. lat. 65–70. L. transv. 13/?.

The height of the body is contained thrice and one-third in the total length (without caudal). Snout with the jaws equal in front; mouth slightly oblique, extending to below the posterior nostril. Dorsal spine strong, smooth. Pectoral fins extending to the root of ventrals. There are six longitudinal series of scales between the lateral line and ventral fin. Coloration uniform. (*Heck.*)

River Tigris.

2. Acanthobrama marmid.

Acanthobrama marmid, *Heckel, l. c.* p. 1075, taf. 9. fig 2.
—— cupida, *Heckel, l. c.* ii. 3. p. 235, taf. 18. fig. 1.

D. 11. A. 19. L. lat. 65–70. L. transv. 13/?.

The height of the body is nearly one-third of the total length (without caudal). Snout obtuse, bent downwards to the mouth, which is but slightly oblique, extending backwards to below the nostrils. Dorsal spine rather feeble, smooth. Lateral line slightly bent downwards. There are six longitudinal series of scales between the lateral line and ventral fin. Coloration uniform. (*Heck.*)

Aleppo.

3. Acanthobrama centisquama.

Heckel, in Russegger's Reisen, i. p. 1074, taf. 9. fig. 1.

D. 11. A. 22. V. 9. L. lat. 100. L. transv. 20/?.

The height of the body is two-sevenths of the total length (without caudal). Snout slightly projecting beyond the mouth, which is oblique and extending backwards to below the nostrils. Dorsal spine strong, long, and smooth, as high as the body. Pectoral fins reaching to the ventrals. Scales without radiated striæ. Lateral line slightly arched. There are ten longitudinal series of scales between the lateral line and ventral fin. Coloration uniform. (*Heck.*)

Damascus.

87. OSTEOBRAMA.

Rohtee, *Sykes, Trans. Zool. Soc.* ii. 1842, p. 364.
Osteobrama, *Heckel*, in *Russegger's Reisen*, i. 1842, p. 1033.

Scales of small size; lateral line running nearly in the middle of the tail. Dorsal fin short, with the third ray enlarged, osseous, and serrated, opposite to the space between ventrals and anal. Anal fin many-rayed. Mouth anterior, with thin lips, the lower not extending across the symphysis of the mandibles. Barbels none. Gill-rakers very short; pseudobranchiæ; air-bladder bipartite. Pharyngeal teeth 6 or 5 . 4 . 3 or 2—3 or 2 . 4 . 6 or 5. Intestinal tract with but a few convolutions.

East-Indian continent.

1. **Osteobrama cotio.**

Cyprinus cotio, *Ham. Buch. Fish. Gang.* p. 339, pl. 39. fig. 93.
Abramis cotis, *M'Clell. Ind. Cypr.* pp. 288, 388.
Osteobrama cotis, *Heckel, in Russegger's Reisen*, i. p. 1033 (name only).
Rohtee vigorsii, *Sykes, Trans. Zool. Soc.* ii. p. 364, tab. 63. fig 4.

D. 11. A. 29-32. L. lat. 70. L. transv. 17/21.

The osseous dorsal ray is serrated. The height of the body is contained twice and two-thirds in the total length (without caudal), the length of the head four times and one-fifth. Profile of the nape concave. The diameter of the eye equals the length of the snout, and is contained thrice and two-thirds in that of the head. Jaws even in front, the lower slightly projecting when the mouth is opened. The pectoral extends beyond the root of the ventral.

Bengal; Dekkan.

a. Adult: skin.
b. Half-grown. River Godaveri. From the Collection of Messrs. von Schlagintweit.

2. **Osteobrama rapax.**

D. 11. A. 25. V. 10. L. lat. 75. L. transv. 18/21.

The osseous dorsal ray is deeply serrated, strong, and shorter than the head. The height of the body is contained thrice in the total length (without caudal), the length of the head thrice and four-fifths. Profile of the nape slightly concave. Eye rather large, as long as the snout, two-sevenths of the length of the head, and wider than the interorbital space. Lower jaw projecting beyond the upper; the maxillary reaches nearly the vertical from the front margin of the orbit. Præorbital as deep as long, suborbitals very narrow. The origin of the dorsal fin is more distant from the end of the snout than from the root of the caudal, and behind the base of the ventral; its last rays are opposite to the anterior of the anal fin. The pectoral reaches beyond the root of the ventral Caudal fin deeply forked. Lateral line straight; there are about twelve longitudinal series of scales between the lateral line and the root of the ventral. Uniform silvery.

Northern parts of the Indian peninsula.

a–b. Five inches long. Presented by Lieut.-Col. Playfair.
c. Seven inches long: stuffed. Presented by Lieut.-Col. Playfair.

3. Osteobrama alfrediana.

Leuciscus duvaucelii, *Cuv. & Val.* xvii. p. 77 (not p. 95).
—— alfredianus, *Cuv. & Val.* xvii. p. xvi (index), pl. 488.
Osteobrama cotis, *Blyth, Journ. As. Soc. Beng.* 1860, p. 158 (not *H. B.*).

D. 10. A. 32–36. L. lat. 60. L. transv. 13/16.

The osseous dorsal ray is slender, slightly serrated. The height of the body is contained twice and two-fifths or twice and a half in the total length (without caudal), the length of the head four times and one-third. Profile of the nape concave. Snout obtuse, arched, shorter than the eye. Upper jaw slightly overlapping the lower. The pectoral fin extends beyond the root of the ventral.

Nepal; Bengal; Assam; Tennasserim.

a. Half-grown. Bengal. Presented by G. R. Waterhouse, Esq.
b. Several half-grown specimens in bad state. Kulu, Himalaya. From the Collection of Messrs. von Schlagintweit.
c. Half-grown. Northern India. Presented by Lieut.-Col. Playfair.
d–e. Half-grown. Cachar. Presented by Lieut.-Col. Playfair.
f. Half-grown. Assam. From the Collection of the East-India Company.
g–i. Adult and half-grown. Cossye River. Presented by Lieut. R. C. Beavan.

4. Osteobrama ogilbii.

Rohtee ogilbii, *Sykes, Trans. Zool. Soc.* ii. p. 364.
Osteobrama ogilbii, *Heckel, l. c.* (name only).

D. 11. A. 15–16. V. 9. L. lat. 50. L. transv. 12/13.

The osseous dorsal ray is deeply serrated, of moderate strength, and as long as the head. The height of the body is contained twice and a fourth in the total length (without caudal). The length of the head four times; profile of the nape slightly concave. Eye large, much longer than the snout, one-third of the length of the head, and narrower than the interorbital space. Snout obtuse, upper jaw overlapping the lower; mouth small; the maxillary reaches nearly the vertical from the front margin of the orbit. Præorbital as deep as long, suborbitals very narrow. The origin of the dorsal fin is more remote from the end of the snout than from the root of the caudal, and behind the base of the ventral. The pectoral reaches to the root of the ventral. Caudal fin deeply forked. Lateral line but little bent downwards; there are nine or ten longitudinal series of scales between the lateral line and the root of the ventral. Silvery a very indistinct blackish blotch on the root of the caudal fin.

Indian peninsula.

a. Madras. Presented by Surgeon Day.
b. Northern India. Presented by Lieut.-Col. Playfair.

5. Osteobrama microlepis.

Systomus microlepis, *Blyth, Journ. As. Soc. Beng.* 1858, p. 289, and 1860, p. 158 (not *Blkr.*).
Rohtee blythii, *Bleek. Prodr. Cypr.* p. 281 (name only).

D. 10. A. 19. L. lat. 73. L. transv. 44.

Dorsal spine finely pectinated; pectorals not reaching to base of ventrals. A large blackish spot near the tail. Much resembling *O. ogilbii.* (*Blyth.*)

Maulmein

88. CHANODICHTHYS*.

Chanodichthys, *Bleek. Cypr. Prodr.* p. 400; and *Nederl. Tydschr. Dierk.* 1864, p. 23.
Parabramis, *Bleek. Nederl. Tydschr. Dierk.* 1864, p. 21.

Scales of moderate size; lateral line running a little below the median line of the tail. Dorsal fin short, with the third ray enlarged, osseous, and smooth, opposite to the space between ventrals and anal. Anal fin many-rayed. Mouth anterior, with thin lips, the lower not extending across the symphysis of the mandibles. Barbels none. Gill-rakers very short; pseudobranchiæ; air-bladder tripartite. Pharyngeal teeth 4 . 3 or 4 . 2—2 . 4 . 4 or 5. Intestinal tract with only a few convolutions.

China; Formosa.

1. Chanodichthys mongolicus.

Leptocephalus mongolicus, *Basilewsky, Nouv. Mém. Soc. Nat. Mosc.* x. 1855, p. 234, taf. 4. fig. 2.
Chanodichthys mongolicus, *Bleek. l. c.* (name only).

D. 9. A. 22.

Body oblong, its depth being about two-sevenths of the total length (without caudal). Mouth of moderate width, with the jaws even in front. Eye apparently rather small. Origin of the dorsal fin immediately behind the root of the ventrals. (*Basil.*)

Mongolia and Mantschuria.

I do not think that this is the type of a genus distinct from *Chanodichthys*, the following species being intermediate between *C. mongolicus* and the others.

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* 1. Leuciscus rhomboidalis, *C. V.* xvii. p. 78.—Founded on an old Chinese drawing.

? 2. Abramis mantschuricus, *Basilewsky, Nouv. Mém. Soc. Nat. Mosc.* x. 1855, p. 239.—Mongolia and Mantschuria. The author ascribes a bilobed air-bladder to this species; so that its systematic position is doubtful.

Also the two following species are said to have the air-bladder bilobed; and it is possible that they belong to a distinct genus. However, the original notices of them are so imperfect that it is of no advantage to science to propose a generic name for them, as has been done by Bleeker:—

? 3. Culter pekinensis, *Basilewsky, l. c.* p. 237; Pseudoculter pekinensis, *Bleek. Cypr. Prodr.* p. 401 (name only).—Peking.

? 4. —— exiguus, *Basilewsky, l. c.*; Pseudoculter exiguus, *Bleeker, l. c.* (name only).—Peking.

2. Chanodichthys macrops.

D. 10. A. 25. L. lat. 57. L. transv. 13/8.

The osseous dorsal ray is not serrated, very strong, and shorter than the head. The height of the body is contained thrice, or nearly thrice, in the total length (without caudal), the length of the head four times and one-third. Profile of the nape slightly concave. Eye large, rather longer than the snout, one-third of the length of the head, and wider than the interorbital space. Jaws even in front, the lower slightly projecting when the mouth is open; the maxillary does not quite reach the vertical from the front margin of the orbit. Præorbital as deep as long, suborbitals very narrow. The origin of the dorsal fin is midway between the end of the snout and the root of the caudal, behind the base of the ventral. The pectoral does not reach the root of the ventral. Caudal fin deeply forked. Lateral line but little arched downwards; there are five and a half longitudinal series of scales between the lateral line and the root of the ventral. Bright silvery, each scale of and above the lateral line with a small patch of minute black dots at the base, more distinct in males than in females. Fins light-coloured.

Intestinal canal twice the length of the body; liver none.

Formosa.

a–e. From 5 to 9 inches long. From Consul Swinhoe's Collection.

3. Chanodichthys terminalis.

Abramis terminalis, *Richards. Ichthyol. Chin.* p. 294.

D. 10. A. 26. L. lat. 55. L. transv. 11½/9.

The osseous dorsal ray is not serrated, strong, and as long as the head. The height of the body is contained twice and one-third or twice and a half in the total length (without caudal), the length of the head four times and a half. Profile of the nape slightly concave. Eye large, rather longer than the snout. Pectoral nearly reaching the root of the ventral.

China.

a–c. From 3½ to 5 inches long. China.

4. Chanodichthys bramula.

Leuciscus bramula, *Cuv. & Val.* xvii. p. 357.
Abramis bramula, *Richards. Ichthyol. Chin.* p. 294.

D. 10. A. 31. L. lat. 46. L. transv. 12/7.

The osseous dorsal ray is not serrated, strong, and as long as the head. The height of the body is contained twice and two-thirds in the total length (without caudal), the length of the head four times and one-fifth. Profile of the nape concave. The diameter of the eye is longer than the snout, its length being contained twice and three-fourths in that of the head. Upper jaw overlapping the lower. The pectoral fin extends to the root of the ventral. Origin of the dorsal fin midway between the root of the caudal and the front margin of the eye.

China.

a. Five and a half inches long. From the Haslar Collection.

5. Chanodichthys pekinensis.

Abramis pekinensis, *Basilewsky, Nouv. Mém. Soc. Nat. Mosc.* x. 1855, p. 239, tab. 6. fig. 2.
Parabramis pekinensis, *Bleek. Nederl. Tydschr. Dierk.* 1864, p. 22.
Culter pekinensis, *Kner, Novara, Fisch.* p. 360, taf. 14. fig. 3.

D. 10. A. 34. V. 9. L. lat. ca 50. L. transv. 11/9.

The osseous dorsal ray is not serrated, strong, and as long as the head. The height of the body is contained thrice in the total length (without caudal), the length of the head five times and one-half. Profile of the nape concave. The diameter of the eye is longer than the snout, its length being one-fourth of that of the head. Upper jaw overlapping the lower. The pectoral fin is scarcely shorter than the head. Origin of the dorsal fin midway between the root of the caudal and the supero-posterior angle of the operculum. (*Blkr.*)

Peking.

There are several not unimportant discrepancies between Bleeker's and Kner's accounts of this fish; the latter was not acquainted with the description given by Bleeker, and erroneously quotes "*Pseudoculter pekinensis*, Blkr.," in the synonymy, which name is intended for a different fish.

The following species is an aberrant form of this genus, if it is not a hybrid:—

6. Chanodichthys leucisculus.

? Culter leucisculus, *Basilewsky, Nouv. Mém. Soc. Nat. Mosc.* x. 1855, p. 238.
? Hemiculter leucisculus, *Bleek. Cypr. Prodr.* p. 401.
Culter leucisculus, *Kner, Novara, Fisch.* p. 362.

D. 9. A. 15. L. lat. 50. L. transv. 8½/?.

The height of the body equals the length of the head, which is one-fourth of the total (without caudal). Cleft of the mouth oblique, of moderate width, with the upper jaw slightly the longer. Origin of the dorsal fin behind the ventral, and behind the middle of the total length (caudal not included). Pectorals nearly reaching ventrals. Abdomen keeled to the vent. [N.B. Abdomine non compresso, *Basilewsky*]. Air-bladder bilobed. (*Kner.*)

China.

89. SMILIOGASTER.

Smiliogaster, *Bleek. Atl. Ichthyol. Cypr.* p. 33.

Body elevated, much compressed, the entire abdominal edge being trenchant. Scales small; lateral line nearly straight. Jaws of equal length; barbels none. Dorsal fin short, *with a strong serrated* spine, placed above the interspace between ventral and anal; anal fin long, many-rayed; caudal fin forked; pectorals rather short. Pharyngeal teeth in a triple series, compressed, with crenulated edge.

Bengal.

1. Smiliogaster belangerii.

Leuciscus belangeri, *Cuv. & Val.* xvii. p. 99.
Smiliogaster belangeri, *Bleek. l. c.* (name only).

D. 10. A. 21. L. lat. 75. L. transv. 45.

The height of the body is contained twice and two-thirds in the entire length, the length of the head five times. Eye of moderate size. The third (longest) dorsal spine is two-thirds as high as the body. Pharyngeal teeth 4 . 2 . 2—2 . 2 . 4. (*Val.*)

Bengal.

90. CULTER*.

Culter, sp., *Basilewsky, Nouv. Mém. Soc. Nat. Mosc.* x. 1855, p. 236.
Culter, *Bleek. Atl. Ichth. Cypr.* p. 33.

Body oblong, much compressed, the entire or the postventral abdominal edge being trenchant. Scales of moderate or small size; lateral line without conspicuous curvature. Mouth directed upwards; barbels none. Dorsal fin short, *with a strong smooth spine,* placed above the interspace between ventral and anal; anal fin long, many-rayed; caudal fin forked; pectorals elongate. Gill-openings very wide; gill-rakers long, setiform. Pseudobranchiæ present. Pharyngeal teeth in a triple series, slender, hooked. Intestinal tract short. Air-bladder tripartite.

China.

1. Culter recurviceps.

Leuciscus recurviceps, *Richards. Ichth. Chin.* p. 295 (1845).
Culter alburnus, *Basilewsky, l. c.* tab. 8. fig. 3 (1855).
—— erythropterus, *Kner, Novara, Fische,* p. 360, taf. 14. fig. 4 (not *Basil.*).

D. 2/7. A. 28. L. lat. 70.

The height of the body equals the length of the head, and is contained four times and one-fourth in the total length (without caudal). Abdominal edge trenchant from behind the ventrals, flattened between the ventrals and pectorals. Nape of the neck convex. The free portion of the tail is two-thirds as high as long. The diameter of the eye is two-sevenths of the length of the head, scarcely less than that of the snout, and much more than the interorbital space, which is very convex. Mouth of moderate width, subvertical, the maxillary not extending to the vertical from the front margin of the eye. Suborbital ring very narrow. The second dorsal spine is of moderate strength, three-fourths of the length of the head. Pectoral fin shorter than the head, extending to the ventral. Coloration uniform silvery.

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* 1. Culter erythropterus, *Basilewsky, Nouv. Mém. Soc. Nat. Mosc.* x. 1855, p. 236, tab. 8. fig. 1.—Rivers near Pekin

Bleeker (Ned. Tydschr. Dierk. ii. p. 27) believes he has identified the *Culter erythropterus* in a badly preserved example with *completely flat abdomen.* As Basilewsky distinguishes the first three species of his genus *Culter* (*C. alburnus erythropterus,* and *mongôlicus*) by "abdomine carinato," and the remainder by "abdomine non compresso," it is evident that Dr. Bleeker is mistaken in his determination, and that the example examined by him may belong to one of the other species. The fact is that all these fishes are extremely similar in appearance and organization, and that they cannot be scattered over various groups as is done in Bleeker's System of Cyprinoids.

2. Culter mongolicus, *Basilewsky, l. c.* p. 237.—Mongolia.

China.

a. Six inches long, in not good state. From the Haslar Collection.

I am unable to find distinctive characters of *Culter alburnus*, Kner, Novara, Fisch. p. 362. He says that the interorbital space is only half as wide as the diameter of the eye; this is also the case in *C. recurviceps*.

2. Culter brevicauda.

Closely allied to *C. recurviceps*, but with the entire abdominal edge trenchant, and shorter tail.

D. 2/7. A. 28–29. L. lat. 65. L. transv. 12/9.

The height of the body is contained thrice and three-fourths in the total length (without caudal), the length of the head four times. Abdominal edge trenchant from the pectorals to the anal. Nape of the neck convex. The free portion of the tail is as high as long. The diameter of the eye is two-ninths of the length of the head, rather less than that of the snout, and more than the interorbital space, which is very convex. Mouth of moderate width, subvertical, the maxillary not extending to the vertical from the front margin of the eye. Suborbital ring very narrow. The second dorsal spine is of moderate strength, three-fifths of the length of the head. Pectoral fin not quite as long as the head, extending to the ventral. Coloration uniform silvery.

Air-bladder tripartite, the hindmost partition being minute. Pharyngeal teeth slender, hooked, 5 . 4 . 2—2 . 3 or 4 . 4.

Formosa.

a–d. Adult (9 inches) and half-grown. From Consul Swinhoe's Collection.

Richardson has described from figures two Chinese fishes which, if the characters indicated by the artist be correct, would appear to belong to a distinct genus, though evidently allied to *Culter*, from which they differ in having the lateral line bent downwards in an abrupt curve behind the pectoral fin. I abstain from naming the genus, as such materials generally prove more or less deceptive:—

1. *Leuciscus acutus*, Richards. Ichth. Chin. p. 297. D. 8? A. 15? L. lat. 34? The height of the body is two-sevenths of the total length (without caudal), the length of the head two-ninths. Mouth oblique; snout pointed, with the jaws equal in length. The dorsal fin is inserted immediately behind the ventrals. Pectoral fins not

longer than the head, and not extending to the ventrals. Dorsal spine strong.

2. *Leuciscus machærioides*, Richardson, *l. c.* The height of the body is one-seventh (one-sixth?) of the entire length, the length of the head less than an eighth. Scales small. The dorsal commences a little behind the front of the ventrals or in the middle of the length, caudal excluded; it equals the anal in the length of its base.—This is a very doubtful species; also the figure on which it is founded cannot be found in our collection of MS. drawings.

91. PELECUS.

Pelecus, *Agassiz, Mém. Soc. Sc. Nat. Neuchât.* i. 1835, p. 39.

Body oblong, much compressed, the entire abdominal edge being trenchant. Scales rather small; lateral line abruptly bent downwards behind the pectoral fin. Mouth directed upwards; barbels none. Dorsal fin short, without pungent spine, placed above the anterior part of the anal; anal fin long, many-rayed; caudal fin forked; pectorals elongate; ventrals well-developed. Gill-openings very wide. Pharyngeal teeth in a double series, hooked. Intestinal tract short.

Eastern Europe.

1. Pelecus cultratus.

Sichel or Ziege (Germany); Skärbraxen (Sweden).
Marsil. Danub. Pan.-Mys. iv. p. 21, tab. 8.
Cyprinus cultratus, *L. Skänska Resa*, p. 81, tab. 2. fig. 1; *Syst. Nat.* i. p. 531; *Bl. Fische Deutschl.* i. p. 255, tab. 37; *Reisinger, Pisc. Hung.* p. 79; *Meidinger*, tab. 25; *Pallas, Zoogr. Ross.-As.* iii. p. 331; *Tiles. Mém. Ac. St. Pétersb.* iv. p. 461, tab. 15. figs. 6, 7.
Esox, sp., *Klein, Pisc. Miss.* v. p. 74, tab. 20. fig. 3.
Chela cultrata, *Cuv. Règne Anim.*
Pelecus cultratus, *Agassiz, l. c.*; *Kröyer, Danm. Fisk.* iii. p. 511; *Heckel & Kner, Süsswasserf.* p. 126; *Nordmann, in Demidoff Voy. Russ. Mérid.* iii. p. 502, pl. 24. fig. 1; *Siebold, Süsswasserf.* p. 152; *Dybowski, Cypr. Livlands*, p. 153; *Malmgren, Wiegm. Arch.* xxx. p. 314.
Leuciscus cultratus, *Cuv. & Val.* xvii. p. 330.
Abramis cultratus, *Nils. Skand. Faun. Fisk.* p. 340.

D. 9–10. A. 28–31. V. 9. L. lat. 92–108. L. transv. 14/6.
Vert. 48.

The height of the body is two-ninths of the total length (without caudal), the length of the head one-fifth; the diameter of the eye is contained thrice and three-fourths in the length of the head. Suborbitals very narrow. The maxillary does not extend to the vertical from the front margin of the eye. Pectoral fin very long, nearly one-third of the total length (without caudal), and nearly extending to the base of the ventral. The first dorsal ray corresponds to the eighth of the anal fin. Coloration uniform.

Pharyngeal teeth 5 . 2—2 . 5, hooked and slightly denticulated.

Eastern Europe; Baltic.

92. EUSTIRA.

Body oblong, much compressed, the entire abdominal edge being trenchant. Scales of moderate size; lateral line abruptly bent downwards behind the pectoral fin. Mouth obliquely directed upwards; barbels none. Dorsal fin of moderate length, without spine, opposite to the anal; anal fin long, many-rayed; caudal fin forked; pectorals elongate; ventrals well developed. Pseudobranchiæ; gill-rakers fine, lanceolate, rather widely set. Pharyngeal teeth 5.3.2—2.3.5, uncinate, not denticulated.

Ceylon.

1. Eustira ceylonensis.

D. 12. A. 17. V. 7. L. lat. 35. L. transv. $7\frac{1}{2}/2$.

The height of the body is two-sevenths of the total length (without caudal), the length of the head one-fourth. The diameter of the eye is more than the length of the snout, and one-third of that of the head; mouth of moderate width, the maxillary extending to below the front margin of the orbit; lower jaw slightly projecting beyond the upper, without symphysial knob. Origin of the dorsal fin slightly in advance of that of the anal. Pectoral fin shorter than the head, extending to the ventral. Suborbital ring broad, covering the cheek. The middle of the hind margin of the gill-membrane is opposite to the præopercular angle. Uniform silvery.

Ceylon.

a–f. 45$^{\text{mm}}$ long. Purchased of Mr. Cuming.

93. CHELA*.

Chela, sp., *Buch. Ham.*, *Bleeker.*
Oxygaster, *v. Hass. Algem. Konst- en Letterb.* 1823, ii. p. 133.
Leuciscus, sp., *Cuv. & Val.*
Laubuca *et* Macrochirichthys, *Bleek. Cypr. Prodr.* pp. 468, 475.
Paralaubuca, *Bleek. Ned. Tydschr. Dierk.* ii. p. 15.

Body oblong, much compressed, the entire abdominal edge being trenchant. Scales of moderate or small size; lateral line without abrupt bend above the pectorals. Mouth directed upwards; barbels none. Dorsal fin short, without strong spine, placed opposite to the origin of the anal fin; anal fin long, many-rayed; caudal fin forked; pectorals elongate; ventrals with at least seven rays. Pseudobranchiæ present. Pharyngeal teeth slender, hooked, without serrature, in a triple or double series.

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* 1. Leuciscus cultellus, *C. & V.* xvii. p. 341, pl. 507; Pelecus cultellus, *Jerdon, Madr. Journ. Lit. & Sc.* xv. 1849, p. 326.—Coromandel, Carnatic.—A. 17. L. lat. 130.
2. —— scalpellus, *C. & V.* xvii. p. 347.—Ceylon.—A. 17.
3. Chela owenii, *Sykes, Trans. Zool. Soc.* ii. p. 361, tab. 63. fig. 1.—Dekkan.—A. 19.
4–6. Chela jorah, Chela teekanee, Chela alkootee, *Sykes, Trans. Zool. Soc.* ii. pp. 361–362, from the Dekkan, are so insufficiently described that they can scarcely be regarded as introduced into the system.
7. Pelecus affinis, *Jerdon, Madr. Journ. Lit. & Sc.* xv. 1849, p. 326.—Mysore, Carnatic.—A. 15.
8. Cyprinus dancena, *Ham. Buch. Fish. Gang.* p. 342.—Ganges.—A. 20.
9. Perilampus perseus, *M'Clell. Ind. Cypr.* pp. 289, 395, tab. 46. fig. 5.—Assam.—A. 21.
10. —— fulvescens, *Blyth, Journ. As. Soc. Beng.* xxix. 1861, p. 163.—Tenasserim.—A. 22.

East Indies.

The species of this genus may be divided into two sections:—

- *a.* Those species in which the sharp median edge in front of the pectoral fins is supported by the dilated bones of the forearm (*Oxygaster*).—
  - *α.* Most of them have the pharyngeal teeth in a triple series (*Oxygaster*), viz. *O. anomalurus*, *O. megalolepis*, *O. hypophthalmus*, and *O. siamensis*.
  - *β.* Pharyngeal teeth in a double series (*Macrochirichthys*): *O. macrochir*.
- *b.* Those species in which the bones of the forearm are not dilated and do not support the thoracic edge (*Securicula*, m.): *Ch. gora*, *Ch. bacaila*, *Ch. argentea*, *Ch. laubuca*, *Ch. clupeoides*.

I should have at once arranged the species in this manner, but several which evidently belong to this group are very insufficiently known, so that it would be impossible in the present state of our knowledge to refer them to the proper place in the system.

1. Chela gora.

Cyprinus gora, *Ham. Buch. Fish. Gang.* p. 263.
Opsarius pholicephalus, *M'Clell. Ind. Cypr.* p. 415, tab. 47. fig. 2 (bad).

D. 10. A. 15. L. lat. ca 160. Vert. 46.

The height of the body is less than the length of the head, which is two-ninths of the total (without caudal). Snout considerably longer than the eye. Nuchal scales extending forwards to above the nostrils. Suborbital ring broad, but leaving a considerable space within the præopercular edge uncovered. The maxillary extends slightly beyond the vertical from the front margin of the eye. The first anal ray is below the fourth of the dorsal fin. Pectoral fin very long, longer than the head, but not extending to the ventral.

Bengal and Assam.

a. Adult. Soan River.
b. Adult: stuffed. Ganges.
c. Half-grown. Assam. From the Collection of the East-India Company.
d. Adult: dried.

2. Chela bacaila.

Cyprinus bacaila, *Ham. Buch. Fish. Gang.* p. 265, pl. 8. fig. 76.
Opsarius bacaila, *M'Clell. Ind. Cypr.* p. 414.
—— leucerus, *M'Clell. l. c.* p. 415, tab. 47. fig. 3.
Leuciscus bacaila, *Bleek. Verh. Bat. Gen.* xxv. *Beng. & Hind.* p. 137.

D. 9. A. 14–16. V. 9. L. lat. 90–110. L. transv. 19/9.

The height of the body is nearly equal to the length of the head, and two-ninths or one-fifth of the total (without caudal). Snout a little longer than the eye. Nuchal scales extending forwards to above the postorbital bone. Suborbital ring broad, nearly entirely covering the cheek, the third bone not being narrower than the præorbital. The maxillary extends beyond the front margin of the eye. Lateral line descending towards the abdomen in a slightly oblique direction. The first anal ray is below the middle of the dorsal fin. Pectoral fin long, longer than the head, sometimes extending to or even beyond the origin of the ventral.

Pharyngeal teeth 5 . 4 . 2—2 . 4 or 3 . 5, compressed, not serrated, hooked.

Bengal.

a. Adult female. India. Presented by G. R. Waterhouse, Esq.
b. Half-grown. Ganges. From M'Clelland's Collection.
c. Half-grown. River Hooghly. From Dr. Bleeker's Collection.
d. Half-grown. Calcutta. From the Collection of Messrs. von Schlagintweit.
e–f. Half-grown. Soan River.
g. Half-grown. Cossye River. Presented by Lieut. R. C. Beavan.
h–i. Half-grown. Cachar. Presented by Lieut.-Col. Playfair.
k. Young. Assam. From the East-India Company.
l. Adult. Moulmein. Presented by Lieut. R. C. Beavan.
m–o. Half-grown. From the Collection of the East-India Company.
p–r. ? Young, in bad state. Manchar Lake, Sindh. From the Collection of Messrs. von Schlagintweit.

3. Chela clupeoides.

Cyprinus clupeoides, *Bloch*, xii. p. 49, tab. 408. fig. 2.
Clupea cyprinoides, *Schneider, in Bloch, Syst. Ichth.* p. 427.
Leuciscus clupeoides, *Cuv. & Val.* xvii. p. 342.
—— dussumieri, *Cuv. & Val.* pl. 508 (see list of plates).

D. 9. A. 14. V. 9. L. lat. 80. L. transv. 15–16 (13/2½).

The height of the body is somewhat less than the length of the head, which is about two-ninths of the total (without caudal). Snout as long as the eye; the maxillary extends to below the eye. Suborbital ring narrower than the diameter of the eye. Thorax compressed into a cutting edge, which is supported by the dilated bones of the forearm. The anal fin commences below the middle of dorsal. Pectoral fin longer than the head, not extending on to the ventral. Pharyngeal teeth 5 . 4 . 3—3 . 4 . 5. Gill-rakers of the outer branchial arch short.

Bloch has described this species from specimens from Tranquebar. Valenciennes believed at first that he had identified it in examples from Mysore (Cuv. & Val. xvii. p. 342, *Leuciscus clupeoides*), adding that the number of scales of the lateral line is 70. However, afterwards (in the list of plates), he states that the two fishes are distinct, not assigning any reason which induced him to change his opinion; accordingly the figure (pl. 508) is named *Leuciscus dussumieri*. It much resembles Bloch's *Cyprinus clupeoides*.

I am indebted for the principal characters of the diagnosis given above to Prof. Peters, who, at my request, examined the typical specimen.

4. Chela phulo.

Cyprinus phulo, *Ham. Buch. Fish. Gang.* p. 262.
Opsarius albulus, *M'Clell. Ind. Cypr.* p. 416, pl. 48. fig. 10.

D. 9. A. 20.

Scales very small. The height of the body is about equal to the length of the head, and two-ninths of the total (without caudal). The dorsal fin commences somewhat in front of the origin of the anal. Pectoral fin longer than the head. (*H. B.*)

North-eastern Bengal

5. Chela novacula.

Leuciscus novacula, *Valenc. in Jacquemont, Voy. Ind.* pl. 15. fig. 2; *Cuv. & Val.* xvii. p. 345.
? Pelecus flavipinnis, *Jerdon, Madr. Journ. Lit. & Sc.* xv. 1849, p. 327.

D. 9. A. 17. L. lat. 60. L. transv. 15/3.

The height of the body is more than the length of the head, and one-fifth of the total (with the caudal). Profile of the abdomen somewhat arched below the pectorals. Lower jaw longer than the upper. Eye large. The dorsal fin is above the anterior anal rays; pectorals extending to or nearly to the ventrals. The lateral line descends in a gentle curve gradually towards the abdomen.

Pharyngeal teeth 5 . 4 . 3—3 . 4 . 5. (*Val.*)

East-Indian continent. (? Cavery River.)

6. Chela diffusa.

Pelecus diffusus, *Jerdon, Madr. Journ. Lit. & Sc.* xv. 1849, p. 327.

D. 9. A. 17. L. lat. 50. L. transv. 9 or 10.

The length of the head is equal to the height of the body, and two-elevenths of "the total length of body;" the diameter of the eye one-third of the length of the head; profile of back perfectly straight. (*Jerdon.*)

Cavery Rivery; 4–6 inches long.

7. Chela argentea.

Day, Proc. Zool. Soc. 1867, p. 301.

D. 9. A. 18. V. 8. L. lat. 43. L. transv. 6½/3.

The height of the body is nearly equal to, or rather more than, the length of the head, which is contained four times and two-thirds in the total length (without caudal). Snout as long as the eye, the diameter of which is two-sevenths of the length of the head. Suborbital ring broad, covering the cheek, the third bone not being narrower than the præorbital. The maxillary extends to below the front margin of the eye; lower jaw with a slight symphysial knob, not projecting beyond the upper jaw. Lateral line descending towards the abdomen in a slightly oblique direction. Origin of the anal fin below the anterior dorsal rays. Pectoral fin long, much longer than the head, extending somewhat beyond the origin of the ventral.

Pharyngeal teeth 5 . 3 . 2—2 . 3 . 5. The middle of the hind margin of the gill-membrane is in advance of the præopercular angle. Thorax not compressed into an edge.

Nilgherries.

a–d. Fine typical specimens. Bowany River. Presented by F. Day, Esq.

8. **Chela laubuca.**

Cyprinus laubuca, *Buch. Ham. Fish. Gang.* p. 260.
Perilampus guttatus, *M'Clell. Ind. Cypr.* p. 394, tab. 45. fig. 4.
Leuciscus laubuca, *Bleek. Verh. Bat. Gen.* xxv. *Beng. & Hind.* p. 138.

D. 10. A. 22–24. V. 7. L. lat. 37. L. transv. $\frac{7\frac{1}{2}}{4}$.

The height of the body is contained twice and four-fifths in the total length (without caudal), the length of the head four times and one-fourth. Snout as long as the eye, which is two-sevenths of the length of the head; mouth oblique, rather narrow, the maxillary scarcely extending to the vertical from the front margin of the orbit. Lower jaw a little projecting beyond the upper, without symphysial hook. Suborbital ring rather broad, the third suborbital covering the cheek nearly entirely. Lateral line slightly curved downwards. Origin of the anal fin in advance of that of the dorsal. Pectoral fin extremely long, much longer than the head, extending to the anal. The scales of the nape do not advance beyond the operculum.

Pharyngeal teeth 5 . 3 . 1—1 or 2 . 3 . 5. The middle of the hind margin of the gill-membrane is below the posterior part of the orbit.

Bengal.

a. River Hooghly. From Dr. Bleeker's Collection.

9. **Chela acinaces.**

? Chela balookee, *Sykes, Trans. Zool. Soc.* 1841, p. 360.
Leuciscus acinaces, *Cuv. & Val.* xvii. p. 347, pl. 509.

D. 9. A. 13.

Scales of moderate size. The height of the body is somewhat less than the length of the head, which is one-fourth of the total (without caudal). The diameter of the eye is two-fifths of the length of the head; suborbital ring broad. Origin of the dorsal fin a little in front of that of the anal Pectoral nearly as long as the head Pharyngeal teeth in three series. (*Val.*)

Mysore. Three inches long.

10. **Chela anomalurus.**

Oxygaster anomalurus, *v. Hass. Algem. Konst- en Letterb.* 1823, ii. p. 133.
Leuciscus oxygaster, *Cuv. & Val.* xvii. p. 349; *Bleek. Nat. Tydschr Ned. Ind.* v. p. 453.

Chela anomalurus, *Bleek. Cypr. Prodr.* ii. p. 473; or *Atl. Ichthyol. Cypr.* p. 136, tab. 42. fig. 2.

D. 9–10. A. 29–32. V. 9. L. lat. 50–55. L. transv. 10/3.

The height of the body is one-fourth of the total length (without caudal), the length of the head two-ninths or one-fifth. Snout as long as the eye, the diameter of which is two-sevenths of the length of the head. Suborbital ring very narrow; the maxillary extends to the front margin of the eye. The lateral line descends in a wide arch to above the ventral fin. Origin of the dorsal fin scarcely in advance of that of the anal. Pectoral fin very long, much longer than the head, extending beyond the root of the ventral. Thorax compressed into a sharpish edge supported by the dilated bones of the forearm. Each caudal lobe with a blackish longitudinal band.

Pharyngeal teeth 5 . 4 . 2—2 . 4 . 5.

Java; Sumatra; Borneo.

a. Adult. From Dr. Bleeker's Collection.
b. Adult. Java. Purchased.

11. Chela hypophthalmus.

Chela hypophthalmus, *Bleek. Cypr. Prodr.* p. 471; or *Atl. Ichthyol. Cypr.* p. 134, tab. 42. fig. 3.

D. 9. A. 31–32. V. 7. L. lat. 59. L. transv. 11/6.

The height of the body is one-third of the total length (without caudal), the length of the head one-fifth. Snout as long as the eye, the diameter of which is two-sevenths of the length of the head. Mouth very oblique, rather narrow, the maxillary not extending to the front margin of the orbit. Mandible with the symphysis scarcely hooked. Suborbital ring narrow. The scales of the nape advance nearly to above the front margin of the orbit. Lateral line descending in a gentle curve towards the ventral fin. Origin of the dorsal fin opposite to that of the anal. Pectoral fin exceedingly long, one-third of the entire length of the fish, extending to the anal. Thorax compressed into a sharp edge supported by the dilated bones of the forearm. Ventral small, inserted somewhat above the abdominal profile.

Pharyngeal teeth 5 . 4 . 2—2 . 4 . 5. The middle of the hind margin of the gill-membrane is opposite to the angle of the præoperculum.

Sumatra.

a. One of the typical examples. From Dr. Bleeker's Collection.

12. Chela siamensis.

D. 9. A. 30. V. 7. L. lat. 43. L. transv. 8/5.

The height of the body is one-third of the total length (without caudal), the length of the head two-ninths. Snout a little shorter than the eye, the diameter of which is two-sevenths of the length of the head. Mouth very oblique, rather narrow, the maxillary scarcely extending to the front margin of the orbit. Mandible with the symphysis distinctly hooked. Suborbital ring narrow. The scales of the nape advance to above the front margin of the orbit. Lateral line descending gradually in a slight curve towards the ventral fin. Origin of the dorsal fin a little in advance of that of the anal. Pectoral fin exceedingly long, one-third of the total length (without caudal), extending to the middle of the space between ventrals and anal. Thorax compressed into a sharp edge supported by the dilated bones of the forearm. Ventral fins small, inserted somewhat above the abdominal profile. Uniform silvery.

The middle of the hind margin of the gill-membrane is in front of the angle of the præoperculum.

Siam.

a. Four inches long. Pachebon (Mouhot). Purchased of Mr. Stevens.

13. Chela megalolepis.

Leuciscus oxygastroides, *Bleek. Nat. Tydschr. Ned. Ind.* iii. p. 432.
Chela oxygastroides, *Bleek. Cypr. Prodr.* p. 472; or *Atl. Ichth. Cypr.* p. 135, tab. 42. fig. 4.

D. 9. A. 30–33. V. 7. L. lat. 40. L. transv. 6/5.

The height of the body is two-sevenths of the total length (without caudal), the length of the head two-ninths. Snout a little shorter than the eye, the diameter of which is two-sevenths of the length of the head. Mouth very oblique, rather narrow, the maxillary not extending to the front margin of the orbit. Mandible with the symphysis distinctly hooked. Suborbital ring very narrow. The scales of the nape advance to above the front margin of the orbit. Lateral line descending gradually in a very slight curve towards the ventral fin. Origin of the dorsal fin opposite to that of the anal. Pectoral fin exceedingly long, two-sevenths of the entire length of the fish, nearly extending to the anal. Thorax compressed into a sharp edge supported by the dilated bones of the forearm. Ventral fins small, inserted somewhat above the ventral profile. A blackish band along each caudal lobe.

Pharyngeal teeth 5 . 4 . 2—2 . 4 . 5. The middle of the hind margin of the gill-membrane is opposite to the angle of the præoperculum.

Java; Sumatra; Borneo.

a. One of the typical examples. From Dr. Bleeker's Collection.

14. Chela paralaubuca.

Paralaubuca typus, *Bleek. Ned. Tydschr. Dierk.* ii. p. 16.

D. 9. A. 31–32. L. lat. ca 53. L. transv. $\frac{12-14}{7-5}$.

The height of the body is one-third of the total length (without caudal), the length of the head two-ninths. Snout much shorter than the eye, the diameter of which is two-fifths, or somewhat less, of the length of the head. The maxillary does not extend to the front margin of the eye; mandible with a symphysial hook. Lateral line descending in a curve towards the ventrals. Dorsal fin nearly entirely in advance of the anal. Pectoral fin longer than the head, nearly extending to the root of the ventral. Pharyngeal teeth 4 . 4 . 2—2 . 4 . 4. Gill-opening extending to below the hind margin of the eye. (*Blkr.*)

Bankok.

15. **Chela sardinella.**

Lenciscus sardinella, *Cuv. & Val.* xvii. p. 344.

D. 9. A. 22.

Scales large and thin. The height of the body is contained five times and one-half in the total length (with the caudal), the length of the head six times and one-half. Eye large, rather close to the end of the pointed snout; lower jaw but slightly projecting beyond the upper. Dorsal fin above the anterior anal rays. Pectorals not extending on to the ventrals, one-fifth of the total length. Curvature of the lateral line inconspicuous.

Pharyngeal teeth 5 . 4 . 3—3 . 4 . 5. (*Val.*)

Irawaddi.

16. **Chela macrochir.**

Leuciscus macrochir, *Cuv. & Val.* xvii. p. 348.

Macrochirichthys uranoscopus, *Bleek. Atl. Ichthyol. Cypr.* p. 137, tab. 43. fig. 1.

D. 9. A. 25–26. V. 9. L. lat. ca 120 *.

The height of the body is nearly equal to the length of the head, which is one-fifth of the total (without caudal). Snout longer than the eye, much compressed; mouth very oblique and wide, the maxillary extending beyond the front margin of the orbit; mandible with the symphysial hook much developed. Suborbital ring narrow. The lateral line descends gradually in a straight line below the middle of the side. Origin of the dorsal fin opposite to that of the anal. Pectoral fin very long, two-sevenths of the total length (without caudal), not reaching the root of the ventral. Thorax compressed into a sharp edge supported by the dilated bones of the forearm. Caudal fin comparatively short, forked; a blackish blotch at its base.

Pharyngeal bones very narrow, teeth small, uncinate 5 . 4—4 . 4 or 5. Gill-rakers rudimentary. The middle of the hinder edge of the gill-membrane is below the hind margin of the eye.

Sumatra; Borneo; Java.

a. From Dr. Bleeker's Collection.

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* The scales are very irregularly arranged, which accounts for the difference of Valenciennes's and Bleeker's statements, the former counting L. lat. 90, the latter 150–175.

94. PSEUDOLAUBUCA.

Pseudolaubuca, *Bleek. Ned. Tydschr. Dierk.* ii. 1864, p. 28.

This genus has been distinguished from *Chela* on account of the dorsal fin, which is situated entirely in advance of the anal fin (cf. *Chela paralaubuca*).

1. Pseudolaubuca sinensis.

Bleek. l. c. p. 29.

D. 9. A. 26. V. 8.

The height of the body is nearly equal to the length of the head, and contained six times and a half in the total (without caudal). Scales of moderate size. Lower jaw with a symphysial hook; cleft of the mouth very oblique. Pharyngeal teeth 5 . 3 . 2 — 2 . 3 . 4. (*Bleek.*)

China.

95. CACHIUS.

Body somewhat elevated, much compressed, nearly the entire abdominal edge being trenchant. Scales of moderate size; lateral line abruptly bent downwards behind the pectoral. Mouth directed upwards; barbels none. Dorsal fin short, without strong spine, placed behind the origin of the anal; anal fin long, many-rayed; caudal fin forked; pectorals elongate; ventrals approximate to the pectorals, with less than seven rays, one of which is produced into a filament. Pseudobranchiæ present. Pharyngeal teeth 5 . 4 . 1—1 . 3 . 5.

East-Indian continent.

1. Cachius atpar.

Cyprinus cachius, *Ham. Buch. Fish. Gang.* p. 258 (young).
—— atpar, *Ham. Buch. l. c.* p. 259 (adult).
Perilampus cachius, *M'Clell. Ind. Cypr.* p. 396, pl. 46. fig. 6.
—— psilopteromus, *M'Clell. l. c.* fig. 4.
Paradanio elegans, *Day, Proc. Zool. Soc.* 1867, p. 297.

D. 9. A. 25–26. V. 5–6. L. lat. 52. L. transv. 10/4.

The height of the body is one-third of the total length (without caudal), the length of the head one-fifth. Snout scarcely as long as the eye, with the lower jaw projecting beyond the upper. Cheek entirely covered by the suborbital ring. The first dorsal ray is opposite to about the eighth of the anal fin. Pectoral fin much longer than the head, but not quite reaching the anal fin. Outer ventral ray prolonged into a long filament, the other rays being quite rudimentary. Greenish, with a silvery lateral band.

Bengal; Southern India.

a–b. Typical specimens of "*Paradanio elegans*." Bowany River. Purchased of Mr. Day.

Thirteenth Group. HOMALOPTERINA.

Dorsal and anal fins short, the former opposite to ventrals. Pectoral and ventral fins horizontal, the former with the outer rays simple. Barbels six (or none). Air-bladder absent. Pharyngeal teeth in a single series, from ten to sixteen in number.

96. HOMALOPTERA*.

Homaloptera, *v. Hass. Algem. Konst- en Letterb.* ii. 1823, p. 133.
Balitora, *Gray, Ind. Zool.* (not characterized); *Cuv. & Val.* xviii. p. 91.
Platycara, sp., *M'Clell. Ind. Cypr.* p. 299.

Head and anterior part of the body depressed; snout more or less spatulate; mouth inferior, small; two pairs of barbels in front of the snout, and one at each angle of the mouth. Pectoral and ventral fins horizontal, many-rayed, the outer rays simple. Dorsal fin short, opposite to ventrals; anal fin very short. Gill-openings narrow; pseudobranchiæ and air-bladder absent. Pharyngeal teeth small, conical, from 10 to 16 in number, in a single series.

East Indies.

1. Homaloptera maculata.

Balitora maculata, *Gray & Hardw. Ind. Zool.* c. fig.
Platycara maculata, *M'Clell. Ind. Cypr.* p. 427, pl. 49. fig. 2 (copied from *Gray*).
—— anisura, *M'Clell. Calc. Journ. Nat. Hist.* ii. p. 587.

D. 11. A. 7. V. 12. L. lat. 78.

Scales smooth. Snout exceedingly broad and depressed, with the margin trenchant; lips fringed; rostral barbels minute, situated on the lower surface of the snout; barbels at the angle of the mouth very small. Origin of the dorsal fin opposite to that of the ventrals; pectoral fins nearly reaching ventrals.

Boutan and Kassyah Mountains, Assam.

a. Adult. Kassyah Mountains. From Griffith's Collection.
b. Adult. Assam. From the Collection of the East-India Company.

2. Homaloptera brucei.

Balitora brucei, *Gray & Hardw. Ind. Zool.* c. fig. (cop. by *M'Clell. Ind. Cypr.* tab. 49. f. 1).
Platycara australis, *Jerdon, Madr. Journ. Lit. & Sc.* 1849, p. 333.
Homaloptera brucei, *Day, Proc. Zool. Soc.* 1867, p. 348.

D. 11. A. 7. V. 9. L. lat. ca 110.

Scales smooth. Snout broad, depressed, with the margin obtuse;

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* 1. Homaloptera bilineata, *Blyth, Journ. As. Soc. Beng.* 1860, p. 172.—Tenasserim.

(Balitora pusilla, *Valenc. in Rev. et Mag. Zool.* 1861, p. 132, from Abyssinia, does not appear to be described.)

lips fringed; rostral barbels short, thick, on the edge of the snout. Origin of the dorsal fin somewhat in advance of that of the ventrals; pectoral fins nearly reaching ventrals. Body and all the fins with large brown spots.

Southern India.

a. Adult. Wynaad. From Mr. Day's Collection.

3. Homaloptera pavonina.

Balitora pavonina, *Cuv. & Val.* xviii. p. 97.
—— erythrorhina, *Cuv. & Val.* xviii. p. 93, pl. 524 (not good).
Homaloptera polylepis, *Bleek. Nat Tydschr. Ned. Ind.* iv. p. 162.
—— ocellata, (? *Van Hass.*) *Van der Hoeven, Handb. Dierk.* edit. 1, ii. p. 211, tab. 13. fig. 12; *Bleek. Cypr. Prodr.* p. 92; or *Atl. Ichthyol. Cypr.* p. 18, tab. 3. fig. 4 * [not. *C. & V.*].

D. 11. A. 7. V. 9. L. lat. 70–75.

Scales smooth, or with one or three very indistinct keels. Snout produced, rather obtuse, and somewhat longer than the remaining portion of the head. Lips not fringed. Barbels simple. Origin of the dorsal fin in advance of that of the ventrals. Pectoral fins terminating at a considerable distance from the ventrals. A series of six or seven large brown yellow-edged ocelli along the back.

Java and Sumatra.

a. Adult. Java.
b. Adult, in bad state. From Dr. Bleeker s Collection.

Balitora ocellata, Cuv. & Val. xviii. p. 96, or *Homaloptera valenciennesi*, Bleek. Atl. Ichth. Cypr. p. 19, is said to differ from *H. pavonina* in having longer pectoral fins which extend on to the ventrals: therefore, this is not the *H. ocellata* described by Bleeker.

The specific names *pavonina* and *ocellata* appear to have originated with Van Hasselt; but as Valenciennes was the first who described certain species under those names, subsequent ichthyologists are bound to follow his determinations.

Homaloptera salusur, Bleek. Nat. Tydschr. Ned. Ind. iv. p. 161; or Prodr. Cypr. p. 94; or Atl. Ichthyol. Cypr. p. 19, tab. 3. fig. 2, is a rather doubtful species; the specimens on which it is founded have cross bars on the back, instead of ocelli, and the head and snout appear to be a little narrower.

a. Type of the species, in bad state. From Dr. Bleeker's Collection.

4. Homaloptera gymnogaster.

Bleek. Nat. Tydschr. Ned. Ind. iv. p. 163; or *Prodr. Cypr.* p. 98; or *Atl. Ichthyol. Cypr.* p. 20, tab. 3. fig. 6.

D. 9. A. 7. V. 9. L. lat. 70.

Scales smooth. Snout obtuse, as long as the remaining portion of the head. Lips not fringed; barbels simple. Origin of the dorsal fin somewhat behind that of the ventrals. Pectoral fins not reaching to the ventrals. Coloration?

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* The figure giving a lateral view of the fish is incorrectly numbered 3 on the plate.

Sumatra.

a. Type of the species. From Dr. Bleeker's Collection.

5. Homaloptera zollingeri.

Homaloptera zollingeri, *Bleek. Nat. Tydschr. Ned. Ind.* iv. p. 158.
—— javanica, (*v. Hass.*) *Bleek. Cypr. Prodr.* p. 89; or *Atl. Ichth. Cypr.* p. 17, tab. 3. fig. 5.

D. 12. A. 7. V. 10. L. lat. 44–45.

Each scale with a single strong keel. Snout half as long as the head, with the margin obtuse; lips not fringed; barbels simple. Origin of the dorsal fin in advance of that of the ventrals; pectoral fins not extending to the ventrals. Back with some obscure cross bands. Caudal fin brown, with the upper lobe whitish.

Java and Sumatra.

a. Type of the species. From Dr. Bleeker's Collection.

6. Homaloptera ophiolepis.

Bleeker, Nat. Tydschr. Ned. Ind. iv. p. 160; or *Cypr. Prodr.* p. 90; or *Atl. Ichthyol. Cypr.* p. 18, tab. 3. fig. 3*.

D. 11. A. 7. V. 10. L. lat. 45–48.

Each scale with a very strong keel, and those on the anterior part of the body with two or four short keels besides. Snout prolonged, pointed, its length being much more than one-half of that of the head. Lips not fringed; barbels simple. Origin of the dorsal fin in advance of that of the ventrals. Pectoral fins terminating at a great distance from the ventrals. A series of large, round, brown spots along the back; fins with brown cross bands.

Java and Sumatra.

a. Type of the species, not in good state. From Dr. Bleeker's Collection.

7. Homaloptera wassinkii.

Homaloptera wassinkii, *Bleek. Nat. Tydschr. Ned. Ind.* iv. p. 163.
—— fasciata, (*v. Hass.*) *Bleek. Prodr. Cypr.* p. 96; or *Atl. Ichthyol. Cypr.* p. 20, tab. 3. fig. 1.

D. 9. A. 7. V. 9. L. lat. 45.

Scales smooth. Snout obtuse, shorter than the remaining portion of the head. Lips not fringed; barbels simple. Origin of the dorsal fin somewhat behind that of the ventrals. Pectoral fins reaching to the ventrals. Five or six brown bands across the back.

Java and Sumatra.

a. Type of the species. From Dr. Bleeker's Collection.

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* The figure giving a lateral view of the fish is incorrectly numbered 4 on the plate.

8. Homaloptera lineolata.

Balitora lineolata, *Cuv. & Val.* xviii. p. 99.

D. 9. A. 5 (?). V. 9.

Scales smooth, larger on the tail than on the trunk. Snout short, rounded; rostral tentacles flat and fringed. Pectoral fins long, extending to the ventrals. Body with five black longitudinal streaks; fins crossed by series of spots. (*Val.*)

Cochinchina.

I follow M'Clelland in associating the following genus with *Homaloptera*. Beside its general outward appearance, scarcely anything is known of its characters; and it is not impossible that future researches will assign to it another place in the system.

97. PSILORHYNCHUS.

Psilorhynchus, *M'Clell. Ind. Cypr.* pp. 300, 428.

Head much depressed; back somewhat arched; snout spatulate; mouth inferior, transverse, small, without barbels. Scales of moderate size. Pectoral fins horizontal. Dorsal fin short, opposite to ventrals; anal fin very short, caudal forked.

East-Indian continent.

1. Psilorhynchus sucatio.

Cyprinus sucatio, *Ham. Buch. Fish. Gang.* p. 347.
Psilorhynchus sucatio, *M'Clell. Ind. Cypr.* pp. 300, 429, tab. 50. fig. 1 (from *Buchanan's MS. drawings*).

D. 9. A. 7. V. 9.

Snout very long, much longer than the remaining portion of the head. Eye large. Dorsal fin elevated.

North-eastern parts of Bengal.

2. Psilorhynchus balitora.

Cyprinus balitora, *Ham. Buch. Fish. Gang.* p. 348.
Psilorhynchus balitora, *M'Clell. Ind. Cypr.* pp. 300, 430, tab. 50. fig. 2 (copied from *Buchanan's MS. drawings*).

D. 10. A. 7. V. 9. L. lat. 33.

Snout rather longer than the remaining portion of the head. Eye of moderate size. Dorsal fin rather high. Two rows of large spots along the side of the body; caudal with cross bands.

North-eastern Bengal; Assam.

Fourteenth Group. COBITIDINA.

Mouth surrounded by six or more barbels. Dorsal fin short or of moderate length; anal fin short. Scales small, rudimentary, or entirely absent. Pharyngeal teeth in a single series, in moderate number. Air-bladder partly or entirely enclosed in a bony capsule. Pseudobranchiæ none.

Europe and Asia.

98. MISGURNUS*.

Misgurnus, *Lacép.* v. p. 16; *Bleek. Atl. Ichthyol. Cypr.* p. 13.
Cobitichthys, *Bleek. Cypr. Prodr.* p. 81.

Body elongate, compressed. No suborbital spine. Ten or twelve barbels, four belonging to the mandible. Dorsal fin opposite to the ventrals; caudal rounded. Air-bladder enclosed in a bony capsule.

Europe; Asia; ? Borneo.

1. Misgurnus fossilis.

Der Schlammpitzger.
Mustela fossilis, *Gesner*, p. 373; *Aldrovand.* v. p. 579; *Willughby, Hist. Pisc.* p. 124.
Misgurn, *Willughby, l. c.* p. 118.
Pissgurn, *Marsil. Danub. Pan.-Mys.* iv. p. 39, pl. 13. fig. 1.
Cobitis, sp., *Artedi, Genera*, p. 2. no. 3; and *Synon.* p. 3. no. 3; *Gronov. Zoophyl.* no. 201.
Enchelyopus, sp., *Klein, Pisc. Miss.* iv. p. 59. no. 5, tab. 35. fig. 3.
Cobitis fossilis, *L. Syst. Nat.* i. p. 500; *Bl. Fische Deutschl.* i. p. 216, taf. 31. fig. 1; *Pall. Zoogr. Ross.-As.* iii. p. 166; *Meidinger*, tab. 47; *Sélys-Longch. Faun. Belge*, p. 193; *Nordmann in Demid. Voy. Russ. Mérid.* iii. p. 469; *Cuv. & Val.* xviii. p. 46; *Kröyer, Danm. Fisk.* iii. p. 553; *Heck. & Kner, Süsswasserf.* p. 298. fig. 161; *Gronov. Syst.* ed. *Gray*, p. 40; *Jeitteles, Verh. zool.-bot. Ges. Wien*, 1862, p. 66; *Siebold, Süsswasserf.* p. 335; *Blanchard, Poiss. France*, p. 289.
Acanthopsis fossilis, *Jeitteles, Fische d. March*, i. 1863, p. 16.
Misgurnus fossilis, *Lacép.* v. p. 17.
Osteology: *Rosenthal, Ichthyotom. Taf.* tab. 10. figs. 1–7.
Baumert, F. M., Chemische Untersuchungen über die Respiration des Schlammpeizgers. Breslau, 1853, 4to.

D. 9. A. 8. V. 7. Vert. 31/19.

Scales very conspicuous. Barbels ten, four belonging to the mandible. Origin of the dorsal fin midway between the root of the caudal and the occiput. Pectoral fin generally as long as the head. A brown band along the middle of the side, separated by a yellowish band from the brown back. Nearly the whole body with brownish-black dots, confluent into vermiculated lines on the back.

Central and Eastern Europe.

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* 1. Cobitis barbatuloides, *Bleek. Nat. Tydschr. Ned. Ind.* ii. p. 435; Cobitichthys barbatuloides, *Bleek. Prodr. Cypr.* p. 82; Misgurnus barbatuloides, *Bleek. Atl. Ichthyol. Cypr.* p. 14, tab. 2. fig. 1.—Borneo.

a. Adult. Holland. From Dr. Bleeker's Collection.
b. Adult: skin. Holland. From Gronow's Collection.
c. Adult. Germany. Purchased of Mr. Brandt.
d, e. Adult and half-grown. South Germany.
f, g, h. Adult and half-grown.
i-k. Half-grown. Switzerland. From Prof. Agassiz's Collection.
l. Skull. Berlin. From Dr. A. Günther's Collection.

2. **Misgurnus anguillicaudatus.**

Cobitis anguillicaudata, *Cantor, Ann. & Mag. Nat. Hist.* ix. 1842, p. 485; *Richards. Voy. Sulph. Fish.* p. 143, pl. 55. figs. 9–10.
—— bifurcata, *M'Clell. Calc. Journ. Nat. Hist.* iv. 1844, p. 400, tab. 23. fig. 1 (bad).
—— pectoralis, *M'Clell. l. c.* fig. 3 (var. with elongate pectoral fins).
—— micropus, *Cuv. & Val.* xviii. p. 29.
—— psammismus, *Richards. Ichthyol. Chin.* p. 300.
—— rubripinnis, *Schleg. Faun. Japon. Poiss.* p. 220, tab. 103. fig. 1.
—— maculata, *Schleg. l. c.* p. 221. fig. 2.
—— decemcirrhosus, *Basilewsky, Mém. Soc. Nat. Mosc.* 1855, p. 239.
Cobitichthys enalios, *Bleek. Act. Soc. Sc. Indo-Neerl.* viii. *Japan*, vi. p. 88, tab. 2. fig. 4 (var. with long pectoral fins).

D. 9. A. 7–8. V. 6–7. Vert. 29/19.

Scales very conspicuous. Barbels ten, four belonging to the mandible. Origin of the dorsal fin midway between the root of the caudal and occiput. Pectoral fin generally shorter than, but sometimes at least as long as, the head. Body and fins irregularly dotted with brownish black; generally a small black spot superiorly on the root of the caudal.

China; Japan; Chusan; Formosa.

A most complete series of examples has convinced me that this species, which represents *M. fossilis* in Eastern Asia, is extremely subject to variation, and that all the names enumerated above refer to nominal species. Specimens well fed have the body much deeper, and particularly the tail is dilated by fatty layers along the upper and lower rudimentary caudal rays. Form of the head and size of the eye varies much; on the whole, young examples have the head lower and more elongate. The pectoral fins are generally short; and this, beside the coloration, is the chief character by which this species is distinguished from *M. fossilis*. However, sometimes these fins are as long as in the European species, and even longer. None of these variations depend on certain localities.

a, b–c, d–e. Adult. China.
f. Half-grown. Ningpo. Purchased of Mr. Cuming.
g, h, i, k, l. Many adult and half-grown specimens. Chusan. From Dr. Cantor's Collection.—Types of the species.
m–q. Adult. Formosa. From Mr. Swinhoe's Collection.
r–s. Adult. Japan. From the Leyden Museum, as *Cobitis erythropterus*.
t. Adult. Japan. From the Leyden Museum, as *Cobitis hæmatopterus*.

u, v. Half-grown. Japan. Purchased of Mr. Jamrach.

w. Young. Japan. From Dr. Bleeker's Collection.—Type of *Cob. enalios*.

x. Skeleton of an adult female. Formosa. From Mr. Swinhoe's Collection.

3. Misgurnus dichachrous.

Cobitichthys dichachrous, *Bleek. Act. Soc. Sc. Indo-Neerl.* viii. *Japan*, vi. p. 89, tab. 2. fig. 2.

D. 10. A. 7. V. 6.

Scales conspicuous; barbels ten, four belonging to the mandible. Origin of the dorsal fin midway between the root of the caudal and gill-opening. Pectoral fin at least as long as the head. The upper half of the fish is brownish black, the lower white, both colours being sharply defined.

Jeddo.

a. Type of the species. From Dr. Bleeker's Collection.

4. Misgurnus polynema.

Cobitichthys polynema, *Bleek. Act. Soc. Sc. Indo-Neerl.* viii. *Japan*, vi. p. 90, tab. 2. fig. 3.

D. 10. A. 7. V. 6.

Scales conspicuous; barbels twelve, four belonging to the mandible. Origin of the dorsal fin midway between the root of the caudal and the gill-opening. Pectoral fin shorter than the head. Nearly uniform brownish, tail and caudal fin with scattered blackish spots.

Jeddo.

a. Type of the species. From Dr. Bleeker's Collection.

5. Misgurnus lateralis.

D. 10. A. 8. V. 7.

Scales very conspicuous. Barbels ten, four belonging to the mandible; the inner pair of the mandibulary barbels are short, and merely an appendage of the outer longer pair. Head and body compressed. The height of the body is rather less than the length of the head, which is one-sixth of the total (without caudal). Snout not quite twice as long as the diameter of the eye, which is two-ninths of the length of the head. Origin of the dorsal fin midway between the end of the snout and the root of the caudal, a little in advance of the root of the ventral. Pectoral fin rather longer than the head. Caudal fin rounded, with the rudimentary rays in small number. A broad brown band runs along the middle of the side, and is separated from the brown back by a yellowish band; another narrow and indistinct brown band on the side of the abdomen. A black white-edged ocellus on the base of the upper half of the caudal fin. Dorsal and caudal fins finely mottled with brown.

Bengal.

a. Three inches and a third long. Presented by G. R. Waterhouse, Esq.

99. NEMACHILUS *.

Cobitis, sp., *Artedi.*
Nemacheilus, *van Hasselt, Algem. Konst- en Letterb.* ii. 1823, p. 133.
Cobitis, *auct.*
Acanthocobitis, *Peters, Monatsber. Ak. Wiss. Berlin,* 1861, p. 712.

No erectile suborbital spine. Six barbels, none at the mandible. Dorsal fin opposite to the ventrals. Air-bladder enclosed in a bony capsule.

Europe and Asia (South Africa?).

The species may be subdivided thus:—

I. Dorsal fin with more than twelve rays, p. 348.
II. Dorsal fin with less than twelve rays.
  A. Body crossed by brownish bands descending to the abdomen, p. 350.
  B. Body with narrow yellow transverse bars, p. 354.
  C. Body without any, or with incomplete cross bands.
    1. Caudal fin rounded or truncate, p. 354.
    2. Caudal fin distinctly emarginate, p. 359.

Appendix, p. 361.

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* 1. Cobitis persa, *Heckel, in Russegger's Reisen,* ii. 3. p. 266.—Persepolis.
2. —— rubripinnis, *Jerdon, Madr. Journ. Lit. & Sc.* xv. 1849, p. 332; ? *Day, Fish. Malab.* p. 203.—Malabar. One of these authors states A. 6, the other A. 2/7.
3. —— mysorensis, *Jerdon, l. c.*—Mysore.
4. —— montanus, *Jerdon, l. c.*—Coorg.
5. —— carnaticus, *Jerdon, l. c.* p. 331.—Carnatic.
6. —— scaturigina, (*Buchanan, MS.*) *M'Clell. Ind. Cypr.* pp. 308, 443, pl. 53. fig. 6.—Bengal?
7. Schistura zonata, *M'Clell. Ind. Cypr.* pp. 308, 441, pl. 53. fig. 1.—Assam.
8. Cobitis chlorosoma, *M'Clell. Ind. Cypr.* pp. 305, 437, pl. 52. fig. 3.—Assam.
9. —— zonalternans, *Blyth, Journ. As. Soc. Bengal,* 1860, p. 172.—Tennasserim.
10. —— cincticauda, *Blyth, l. c.*—Tennasserim.
11. —— zebrata, *Castelnau, Poiss. Afr. Austr.* p. 56.—Cape Town.
12. —— punctifer, *Castelnau, l. c.*—Cape Town.
13&14. —— rupelli and C. mooreh, *Sykes, Trans Zool. Soc.* ii. p. 366, pl. 64. fig. 1.—Dekkan. D. 12–13.
15. —— merga, (*Krynicki*) *Nordm. in Demid. Voy. Russ. Mérid.* iii. p. 470; *Kessler, Bull. Soc. Nat. Mosc.* 1859, i. p. 540; Cobitis nurga, *Cuv. & Val.* xviii. p. 24.—Southern Russia.

I. *Dorsal fin with more than twelve rays* (Acanthocobitis).

1. Nemachilus pavonaceus.

Cobitis pavonacea, *M'Clell. Ind. Cypr.* pp. 305, 437, pl. 52. fig. 1.

D. 17. A. 6. V. 9 (?).

Caudal fin convex, dorsal elongate. About twenty narrow dark bars across the dorsal half of the body. A black-and-white ocellus on the upper part of the root of the caudal fin; dorsal and caudal fins crossed by numerous bars. (*M'Cl.*)

Assam.

Acanthocobitis longipinnis, Peters, Monatsber. Ak. Wiss. Berl. 1861, p. 712, from the Ganges, is, as suggested by the author, if not identical with, at all events closely allied to, the above species. Prof. Peters gives as formula of the fin-rays, D. 4/18. A. 3/6. V. 1/7. M'Clelland is not very exact as regards the number of fin-rays, and the example in the Berlin Museum has lost its colours; so that some allowance must be made for the discrepancies in the accounts given of this fish.

2. Nemachilus semizonatus.

Cobitis semizonata, *Blyth, Journ. As. Soc. Bengal*, 1860, p. 171.

D. 16. A minute spinelet above the muzzle. Tail slightly bilobate. A series of from twelve to fourteen dark transverse dorsal cross bands, occasionally forked or confluent, reaching the lateral line, below which is a longitudinal row of about twelve irregular blackish spots. A black white-edged ocellus superiorly on the base of the caudal. Dorsal fin with four or five irregular rows of dark spots; caudal with seven or eight dark transverse lines. (*Blyth.*)

Tennasserim.

3. Nemachilus rubidipinnis.

Cobitis rubidipinnis, *Blyth, Journ. As. Soc. Bengal*, 1860, p. 170.

D. 15. A short, broad, obtuse, spine-like process projecting from the middle of the upper lip. Tail somewhat rounded. Olive-brown, dorsal and caudal fins transversely rayed with dusky; the other fins without markings. On the dorsal are four or five rows of dark spots, on the caudal ten or more transverse lines. (*Blyth.*)

Tennasserim.

4. Nemachilus urophthalmus.

D. 14. A. 7. V. 8.

The præorbital terminates behind in a slight and obtuse projection situated below the eye, sometimes moveable, sometimes hidden below the skin. Scales very distinct, imbricate. Caudal fin subtruncate, with the angles rounded. Body compressed; its height is one-fourth of the total length (without caudal), the length of the head a little less than one-fourth. Origin of the dorsal fin scarcely nearer to the end of the snout than to the root of the caudal. Snout of moderate length; eye occupying the middle of the length of the head, of moderate size, one-fourth of the length of the head. Body with from ten to thirteen dark-brown cross bands, somewhat lighter in the middle, and separated from one another by narrow yellow streaks (ground-colour); head spotted with brown. A black white-edged ocellus on the base of the upper caudal lobe. Dorsal and caudal fins with six transverse series of black dots.

Ceylon.

a–b. Two and a third inches long. Southern Ceylon. Purchased of Mr. Cuming.

5. Nemachilus botia.

Cobitis botia, *Ham. Buch. Fish. Gang.* p. 350.
—— bilturio, *Ham. Buch. Fish. Gang.* p. 358.
—— bimucronata, *M'Clell. Ind. Cypr.* pp. 304, 435, tab. 51. fig. 5 (cop. from *Buchanan's MS. drawings*).
—— ocellata, *M'Clell. Ind. Cypr.* pp. 304, 436, tab. 51. fig. 6 (cop. from *Buchanan's MS. drawings*).

D. 13. A. 7. V. 8.

The præorbital terminates behind in a slight and obtuse projection situated below the eye, sometimes moveable (*C. botia*), sometimes hidden below the skin (*C. bilturio*). Scales very distinct, imbricate. Caudal fin subtruncate. Body compressed; its height is one-fifth of the total length (without caudal), the length of the head a little less than one-fourth. Origin of the dorsal fin nearer to the end of the snout than to the root of the caudal. Snout of moderate length; eye occupying the middle of the length of the head, of moderate size. Head and body with brown spots; a series of rounded spots along the lateral line; a brown streak from the eye to the end of the snout. A black ocellus, edged with white, on the base of the upper part of the caudal fin. Dorsal and caudal fins crossed by about five series of small spots.

Bengal.

a–d. Fine specimens. Cossye River. Presented by Lieut. R. C. Beavan. (Without suborbital prominence.)

e. Adult. Morar River. Presented by Lieut. R. C. Beavan. (With a suborbital prominence.)

f–g. Half-grown. Northern India. Presented by Lieut.-Colonel Playfair. (With a suborbital prominence.)

6. Nemachilus fasciatus.

Nemachilus fasciatus, *Kuhl & v. Hass. Algem. Konst- en Letterb.* 1823, ii. p. 133; *Bleek. Atl. Ichthyol. Cypr.* p. 7, tab. 2. fig. 7.
Cobitis fasciata, *Cuv. & Val.* xviii. p 25; *Bleek. Nat. Tyds. Ned. Ind.* vii. p. 96; or *Cypr. Prodr.* p. 78.
—— suborbitalis, *Cuv. & Val.* xviii. p. 26.
—— chrysolaimos, *Cuv. & Val.* xviii. p. 27, pl. 521.
—— jacklesi, *Bleek. Nat. Tyds. Ned. Ind.* iii. p. 604; or *Cypr. Prodr.* p. 80.
Nemachilus jaklesi, *Bleek. Atl. Ichthyol. Cypr.* p. 8, tab. 2. fig. 5

D. 12–14. A. 7. V. 7.

Scales very conspicuous. Caudal fin forked. The origin of the dorsal fin is nearly midway between the end of the snout and the root of the caudal. The height of the body is considerably less than the length of the head, which is one-fifth or two-ninths of the total (without caudal). Snout of moderate length, somewhat pointed, a little shorter than the postorbital portion of the head. Eye rather small. Body with from eleven to twenty brown vertical bands; a dark band across the root of the caudal. Sometimes a black spot at the base of the anterior dorsal rays.

Java; Sumatra; Borneo.

a. Java. From Dr. Bleeker's Collection.
b. Type of *C. jacklesi.* Sumatra. From Dr. Bleeker's Collection.
c–e. Fine specimens. Sarawak. Presented by the Marquis Doria. —These examples have a black spot on the dorsal fin.

II. *Dorsal fin with less than twelve rays.*

A. *Body crossed by brownish bands descending to the abdomen.*

7. **Nemachilus montanus.**

Schistura montana, *M'Clell. Ind. Cypr.* pp. 307, 440, tab. 57. fig. 1.

D. 10. A. 7. V. 8.

The præorbital terminates behind in a slight and obtuse projection situated below the eye, sometimes moveable, sometimes hidden below the skin. Scales not very distinct. Caudal fin conspicuously emarginate. Body slightly compressed, its height is one-sixth of the total length (without caudal), the length of the head a little less than one-fifth. Origin of the dorsal fin midway between the end of the snout and the root of the caudal. Snout of moderate length, a little shorter than the postorbital portion of the head. Eye very small. The free part of the tail is as deep as long. Pectoral fin long, three-fourths of the distance of its root from the ventral. Upper margin of the dorsal fin straight, oblique. Body crossed by twelve brown bands, broader than the interspaces between them. A black band across the root of the caudal. Dorsal and caudal fins with a single row of spots.

Simla.

a–b. Probably the typical specimens. From the Collection of the East-India Company.

8. **Nemachilus beavani.**

D. 10. A. 7. V. 7.

Scales inconspicuous. Caudal fin slightly emarginate. Origin of the dorsal fin midway between the end of the snout and root of the caudal. The height of the body is one-fifth of the total length (without caudal), the length of the head a little less than one-fourth. Snout as broad as deep, of moderate length, shorter than the postorbital portion of the head. Eye small. No nasal barbel. Upper margin of the dorsal fin rounded anteriorly, straight and oblique posteriorly. Length of the pectoral fin two-thirds of the distance of its root from the ventral. Free portion of the tail as long as deep. Body with nine dark cross bands, broader than the interspaces between; a black streak across the root of the caudal. Dorsal and caudal rays with blackish dots.

Bengal.

a. Two inches long. Kossye River. Presented by Lieut. R. C. Beavan.

9. **Nemachilus rupecola.**

Schistura rupecula, *M'Clell. Journ. As. Soc.* vii. tab. 55. fig. 3; and *Ind. Cypr.* p. 309, tab. 57. fig. 3.

D. 11. A. 7. V. 7–8.

Scales inconspicuous. Caudal fin truncate, its lobes being rounded, like all the other fins. Origin of the dorsal fin somewhat nearer to the root of the caudal than to the end of the snout. The height of the body is much less than the length of the head, which is one-fifth of the total (without caudal). Head broad, depressed, especially the snout, which is as long as the postorbital portion of the head; eye very small. Barbels well developed; a very distinct nasal appendage. Length of the pectoral fin more than one-half of the distance of its base from the ventral. Body with fourteen or fifteen dark cross bands, broader than the interspaces between them; a black spot at the base of the anterior dorsal rays.

Himalayas.

a–b. Fine specimens. Sikkim. From the Collection of Messrs. von Schlagintweit.

10. **Nemachilus subfuscus.**

Schistura subfusca, *M'Clell. Ind. Cypr.* pp. 308, 443, pl. 53. fig. 5.

D. 11. A. 7. V. 7.

Caudal fin emarginate; upper margin of the dorsal fin straight, oblique. Body encircled by ten regular brown zones, which are much narrower than the interspaces between them. (*M'Cl.*)

Assam.

11. **Nemachilus nudus.**

Nemacheilus nudus, *Bleek. Nederl. Tydschr. Dierk.* 1864, p. 12.

D. 11. A. 7. V. 8.

Trunk scaleless, tail with inconspicuous scales. Caudal fin emarginate, with the lobes pointed. The height of the body is much less than the length of the head, which is one-fifth of the total (without caudal). The eye occupies the middle of, and is two-elevenths of, the length of the head; width of the interorbital space a little more than the diameter of the eye. Upper margin of the dorsal fin straight, oblique; the length of the pectoral fin is a little more than one-half of the distance of its root from the ventral. Body with about fifteen dark cross bands, broader than the interspaces between them and becoming irregular towards the caudal fin, where they are broken up into spots. Dorsal fin with a dark spot anteriorly at the base, and with a series of dark dots. (*Blkr.*)

Mongolia.

12. Nemachilus denisonii.

Nemacheilus denisonii, *Day, Proc. Zool. Soc.* 1867, p. 287.

D. 10. A. 7. V. 7.

Scales inconspicuous. Caudal fin subtruncate, with the lobes rounded, but one ray projecting beyond the margin of the fin superiorly and inferiorly. Origin of the dorsal fin midway between the end of the snout and the root of the caudal. The height of the body is much less than the length of the head, which is a little less than one-fourth of the total (without caudal). Head rather depressed; snout of moderate length, shorter than the postorbital portion of the head; eye rather small. Length of the pectoral fin two-thirds of the distance of its base from the ventral. Body with about nine dark cross bands, broader than the interspaces between them. Dorsal and caudal fins traversed by a series of brown dots.

Nilgherries.

a. One of the typical specimens. Bowany River. From Mr. Day's Collection.

13. Nemachilus notostigma.

Nemacheilus notostigma, *Bleek. Verh. Holl. Maatsch. Haarlem*, 1864, *Cobit. et Cypr. Ceyl.* p. 5, tab. 1. fig. 2.

D. 10. A. 7. V. 7.

Scales rather inconspicuous. Caudal fin distinctly emarginate. The origin of the dorsal fin is midway between the end of the snout and the root of the caudal. The height of the body is much less than the length of the head, which is a little more than one-fifth of the total (without caudal). Snout of moderate length, somewhat shorter than the postorbital portion of the head. Eye not very small. The free portion of the tail is as long as deep. The length of the pectoral fin is three-fifths of the distance of its root from the ventral. Upper margin of the dorsal fin slightly oblique, straight, with the anterior corner rounded. Body with twelve or thirteen brownish cross bands, broader than the interspaces between them; a blackish streak crosses the root of the caudal. Each dorsal ray with two or three, each caudal ray with three or four, black dots. A black spot at the base of the anterior dorsal rays.

Ceylon.

a, *b–c*, *d–g*. Fine specimens. Purchased of Mr. Cuming.

14. Nemachilus triangularis.

Nemacheilus triangularis, *Day, Proc. Zool. Soc.* 1865, p. 295; or *Fish. Malab.* p. 203, pl. 14. fig. 1 (bad).

D. 10. A. 7.

Scales very conspicuous. Caudal fin conspicuously emarginate. Origin of the dorsal fin nearly midway between the end of the snout and the root of the caudal. The height of the body is much less than the length of the head, which is two-ninths of the total (without caudal). The free portion of the tail is rather deeper than long. Snout somewhat pointed, of moderate length, a little shorter than the postorbital portion of the head. Eyes small. Upper margin of the dorsal fin straight, oblique. Body with about eight dark cross bands, finely edged with black; they are angularly bent, the angles pointing backwards. A black spot at the root of the caudal; three black bars across each caudal lobe.

Travancore Hills.

a, *b*. Two of the typical examples. Presented by Mr. Day.

15. **Nemachilus tigris.**

Cobitis tigris, *Heckel, in Russegger's Reisen*, i. p. 1088, taf. 12. fig. 4.

D. 11. A. 7.

Caudal fin slightly emarginate. Origin of the dorsal fin nearly midway between the end of the snout and the root of the caudal. The height of the body is somewhat less than the length of the head, which is one-fifth of the total (without caudal). Snout of moderate length, obtuse, a little shorter than the postorbital portion of the head. Eye small. Length of the pectoral more than one-half of the distance of its base from the ventral. Upper margin of the dorsal fin straight, nearly horizontal. Body with about fifteen rather irregular blackish cross bands; a black band across the root of the caudal. (*Heck.*)

River Kueik, near Aleppo.

16. **Nemachilus semiarmatus.**

Nemacheilus semiarmatus, *Day, Proc. Zool. Soc.* 1867, p. 286.

A comparison of this species with the figure of *C. tigris* does not show any essential difference, except that the Indian species is provided with a dark spot below the eye.

Nilgherries.

a–c. Types of the species. From Mr. Day's Collection.

17. **Nemachilus striatus.**

Day, Proc. Zool. Soc. 1867, p. 347.

D. 10. A. 7. V. 8.

The length of the head is one-seventh of the total (with the caudal), the height of the body one-eleventh. Scales well developed. The diameter of the eye is nearly one-fourth of the length of the head. Base of the dorsal fin midway between the snout and the posterior extremity of the caudal fin. Caudal slightly lobed at its posterior extremity. Reddish brown, with very narrow light-reddish vertical bands*, most distinct in the posterior part of the body, where there are sixteen posterior to the commencement of the dorsal fin, and several more between that and the head, which last is marked all over with black lines and spots on a light-reddish base. Base of the caudal fin with a black bar. Dorsal fin with a light margin, bounded below by a jet-black band, and having a dark base. (*Day.*)

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* The author has probably confounded the ornamental with the ground-colour.

Wynaad (2½ inches long).

B. *Body with narrow yellow transverse bars.*

18. **Nemachilus savona.**

Cobitis savona, *Ham. Buch. Fish. Gang.* p. 357; *M'Clell. Ind. Cypr.* p. 308, pl. 53. fig. 3 (copied from *Buchanan's MS. drawings*).

D. 10. A. 6.

Caudal fin emarginate; upper margin of the dorsal fin straight, oblique. Back dusky, with about ten narrow yellow transverse bars. (*H. B.*)

Northern Bengal.

C. *Body without any, or with incomplete cross bands.*

1. *Caudal fin rounded or truncate.*

19. **Nemachilus barbatulus.**

Loach. Die Grundel or Schmerle. La Loche. Grönling (*Swed.*).

Cobitis barbatula, *Rondel.* ii. p. 204; *Aldrov.* v. c. 31, p. 618; *Gesner, De Aquat.* p. 404.

—— fluviatilis, *Schonev.* p. 31.

Fundulus, *Marsil. Danub. Pan.-Mys.* p. 74, tab. 25. fig. 1.

Loche, *Willughby, Hist. Pisc.* p. 265, tab. Q. 8. fig. 1; *Pennant, Brit. Zool.* iii. p. 247, pl. 58, or, edit. 1812, iii. p. 379, pl. 69; *Couch, Fish. Brit. Isl.* iv. p. 69, pl. 199.

Cobitis, sp., *Artedi, Genera*, p. 2. no. 2; *Synon.* p. 2. no. 1.

Cobitis barbatula, *L. Syst. Nat.* i. p. 499; *Bloch, Fische Deutschl.* i. p. 224, taf. 31. f 3; *Bl. Schn.* p. 434; *Lacép.* v. p. 8; *Müller, Faun. Dan. Prodr.* p. 47; *Pall. Zoogr. Ross.-As.* iii. p. 164; *Donov. Brit. Fish.* i. pl. 22; *Turton, Brit. Faun.* p. 103; *Fleming, Brit. An.* p. 189; *Jenyns, Manual*, p. 416; *Parnell, Wern. Mem.* vii. p. 270; *Yarrell, Brit. Fish.* i. p. 376, or, ed. 2, i. p. 427, or, edit. 3, i. p. 446; *Meidinger*, tab. 18; *Fries och Ekstr. Skand. Fisk.* pl. 53; *Nilss. Skand. Faun. Fisk.* p. 343; *Sélys-Longch. Faune Belge*, p. 193; *Nordmann, in Demid. Voy. Russ. Mérid.* iii. p. 470; *Cuv. & Val.* xviii. p. 14, pl. 520; *Kröyer, Danm. Fisk.* iii. p. 539; *Günth. Fische d. Neckars*, p. 104; *Rapp. Fische d. Bodensee's*, p. 11; *Heckel & Kner, Süsswasserf.* p. 301. fig. 162; *Jeitteles, Fische d. March*, 1863, i. p. 19; *Siebold, Süsswasserf.* p. 337; *Malmgren, Wiegm. Arch.* 1864, p. 306; *Canestrini, Arch. p. la Zool. etc.* iv. 1866, p. 146; *Blanchard, Poiss. France*, p. 280.

Enchelyopus, *Klein, Pisc. Miss.* iv. p. 59. no. 3, pl. 15. fig. 4.

Duhamel, Pêches, ii. sect. 3. p. 521, pl. 27. fig. 3.

Cobitis barbatula, var. merga, *Jeitteles, Verhand. zool.-bot. Ges. Wien*, 1862, p. 311, tab. 11. fig. 3 (this does not appear to be the true *C. merga* of Krynicki).

Air-bladder: *Rosenthal, Ichthyotom. Taf.* tab. 10. fig. 8.

D. 10. A. 7. V. 7. Vert. 23/16.

Caudal fin truncate, with the corners rounded. Origin of the dorsal fin midway between the end of the snout and the root of the caudal fin. The height of the body is less than the length of the head, which is one-fifth of the total (without caudal). Snout produced, obtuse, a little longer than the postorbital portion of the head. Eye small, with free orbital rim, its length being equal to the width of the interorbital space. Length of the pectoral about one-half of the distance of its root from the ventral. Upper margin of the dorsal fin obliquely descending backwards. Back and sides irregularly mottled with dark brown; generally a blackish blotch on the lower half of the base of the caudal. Dorsal and caudal fins with brownish-black spots arranged in irregular cross bands.

Europe, with the exception of Denmark and Scandinavia.

a. Adult. Holland. From Dr. Bleeker's Collection.
b–d. Adult. Neckar. From the Stuttgart Collection.
e–h. Adult. River Blau. From the Stuttgart Collection.
i–m. Adult and half-grown. Danube.
n. Adult. Moravia (named *Cobitis variabilis*, Heckel).
o, *p–q*. Adult and half-grown.
r. Half-grown. England. Presented by T. Gray, Esq.

20. **Nemachilus galilæus.**

Cobitis galilæa, *Günth. Proc. Zool. Soc.* 1864, p. 493.

D. 12. A. 8. V. 7.

Scaleless. Caudal fin truncate. The origin of the dorsal fin is somewhat nearer to the end of the snout than to the root of the caudal. The height of the body is considerably less than the length of the head, which is contained five times and one-fourth in the total (without caudal). Snout of moderate length, a little shorter than the postorbital portion of the head. Eye small, with a free circular eyelid, its diameter not being quite as wide as the interorbital space. Length of the pectoral more than one-half of the distance of its base from the ventral. Upper margin of the dorsal fin straight, oblique. Body finely mottled with brown; four brown cross bars on the back before, and four behind the dorsal fin.

Lake of Galilee.

a. Type of the species, 3 inches long. Presented by Th. W. Beddome, Esq.

21. **Nemachilus panthera.**

Cobitis panthera, *Heckel, in Russegger's Reisen*, i. p. 1087, taf. 12. fig. 2.
—— leopardus, *Heckel, l. c.* ii. p. 241, taf. 18. fig. 4.

D. 10. A. 7. V. 6.

Caudal fin truncate. Origin of the dorsal fin nearly midway between the end of the snout and the root of the caudal. The height of the body is less than the length of the head, which is two-ninths, or rather more than one-fifth, of the total (without caudal). Snout of moderate length, obtuse, somewhat shorter than the postorbital portion of the head. Eye small. Length of the pectoral fin more than one-half of the distance of its root from the ventral. Upper margin of the dorsal fin convex. Head and body with small, densely crowded, irregular black spots and dots; sometimes a black vertical spot on the root of the caudal. (*Heck.*)

Damascus.

22. Nemachilus melapterurus.

Cobitis malapterura, *Cuv. & Val.* xviii. p. 88, pl. 523.

D. 8 (?). A. 7.

Scales inconspicuous. Dorsal fin subtruncate, with the corners rounded. Origin of the dorsal fin somewhat nearer to the root of the caudal than to the end of the snout. The height of the body is much less than the length of the head, which is one-fifth of the total (without caudal). Skin on the back of the tail raised into a fold, like a low adipose fin. Snout somewhat produced. Upper margin of the dorsal fin convex; the length of the pectoral fin is less than one-half of the distance of its root from the ventrals. Body irregularly reticulated with blackish. A band across the root of the caudal. Dorsal and caudal fins with transverse series of blackish dots. (*Val.*)

Syria.

23. Nemachilus marmoratus.

Cobitis marmorata, *Heckel, Fisch. Kaschm.* p. 76, taf. 12. figs. 1, 2; or *Hügel, Kaschm.* iv. p. 380.

—— vittata, *Heckel, l. c.* p. 80. figs. 3–4; or *Hügel, Kaschm.* iv. p. 382.

D. 10. A. 7. V. 7.

Scaleless. Caudal fin rather convex. The origin of the dorsal fin is nearly midway between the end of the snout and the root of the caudal. The height of the body is less than the length of the head, which is two-ninths of the total (without caudal). Free portion of the tail not elongate. Snout somewhat produced and pointed, as long as the postorbital portion of the head. Eye small. Length of the pectoral not much more than one-half of the distance of its root from the ventral. Upper margin of the dorsal fin straight, very oblique. Body mottled with brown. Specimens with bands across the back of the tail, and with a dark lateral line, have been described as *C. vittata.* (*Heck.*)

Cashmere.

24. Nemachilus ladacensis.

D. 11. A. 7. V. 8.

Scaleless. Caudal fin rounded. The origin of the dorsal fin is nearer to the end of the snout than to the root of the caudal. The height of the body is considerably less than the length of the head, which is more than one-fifth of the total length (without caudal). The free portion of the tail is very low, its depth being nearly one-fourth of its length. Eye not very small, one-fifth of the length of the head. Snout moderately produced, obtuse, as long as the postorbital portion of the head. The length of the pectoral is much more than one-half of the distance of its base from the ventral. Upper margin of the dorsal fin oblique, straight, with the upper corner slightly rounded. All the fins rather elongate. Reddish-olive, with about nine blackish bars across the back, and a few small scattered spots on the side and caudal fin.

Tibet.

a. Three inches long. Ladak. From the Collection of Messrs. von Schlagintweit.

25. Nemachilus microps.

Cobitis microps, *Steindachner, Verh. zool.-bot. Ges. Wien*, 1866, p. 794, taf. 13. fig. 3.

D. 10. A. 7. V. 7.

Scaleless*. Caudal fin scarcely emarginate. Origin of the dorsal fin somewhat nearer to the root of the caudal than to the end of the snout. The height of the body is much less than the length of the head, which is one-fifth of the total (without caudal). Head broad, depressed: snout thick, as long as the postorbital portion of the head; eye very small. Length of the pectoral fin about one-half of the distance of its base from the ventral. Body with numerous vermiculated narrow transverse stripes, more or less confluent on the back into broad cross bands, sixteen or seventeen in number. (*Steind.*)

Tibet (16,000 feet above the level of the sea).

This fish appears to be closely allied to *C. rupecola*.

26. Nemachilus tenuicauda.

Cobitis tenuicauda, *Steindackner, Verhandl. zool.-bot. Ges. Wien*, 1866, p. 792, taf. 17. fig. 3.

D. 11. A. 7. V. 8.

Scaleless. Caudal fin truncate. The origin of the dorsal fin is conspicuously nearer to the root of the caudal than to the end of the snout. The height of the body is considerably less than the length of the head, which is nearly one-fifth of the total (without caudal). The free portion of the tail is very low, its depth being one-third, or rather less than one-third, of its length. Eye not very small, two-ninths, or one-sixth, of the length of the head. The length of the pectoral is not much more than one-half of the distance of its base from the ventral. Upper margin of the dorsal fin oblique, with the upper corner rounded. Upper part of the side, and dorsal and caudal fins, irregularly mottled with brown; a more or less distinct series of spots along the lateral line.

Tibet.

a, b. Several examples, from 2 to 4½ inches long. Ladak. From the Collection of Messrs. von Schlagintweit.

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* I suppose that the author mentioned, who describes the skin as *smooth*, intended to express that the skin is *naked*, inasmuch as no Cobitoid fish has a *rough* skin.

27. Nemachilus spilopterus.

? Cobitis spiloptera, *Cuv. & Val.* xviii. p. 27, pl. 522.

D. 10. A. 7. V. 7.

Body naked. Caudal fin subtruncate. Origin of the dorsal fin midway between the extremity of the snout and the root of the caudal. The height of the body is much less than the length of the head, which is rather more than one-fifth of the total (without caudal). The free portion of the tail is twice as long as deep. Snout of moderate length, as long as the postorbital portion of the head. Eyes directed upwards. Length of the pectoral fin about one-half of the distance of its root from the ventral. Upper margin of the dorsal fin oblique. Back with about eleven irregular dark cross bands not descending on the sides; a black band across the root of the caudal fin. A black spot on the base of the anterior three dorsal rays.

Cochin-China; Assam.

a. Adult. Assam. From the Collection of the East-India Company.

28. Nemachilus butanensis.

? Cobitis butanensis, *M'Clell. Calc. Journ. Nat. Hist.* ii. p. 586.

D. 9. A. 7. V. 7.

Scales conspicuous. Caudal fin rounded. The origin of the dorsal fin is much nearer to the end of the snout than to the root of the caudal. The height of the body is considerably less than the length of the head, which is one-sixth of the total (without caudal). The free portion of the tail is elongate, compressed, its depth being nearly one-half of its length. Eye very small, nearly in the middle of the length of the head. The length of the pectoral is less than one-half of the distance of its base from the ventral. Upper margin of the dorsal fin subhorizontal, convex. Lips ciliated. Coloration?

Butan.

a. ? Typical specimen, 5 inches long. From Griffith's Collection.

I can only conjecture that this is the typical specimen of the species indicated by M'Clelland. It is from Griffith's Collection, and similar in its state of preservation to other examples collected by him. M'Clelland's diagnosis is so short as to be applicable to a great number of Loaches.

29. Nemachilus monoceros.

Cobitis monoceros, *M'Clell. Ind. Cypr.* pp. 305, 438, pl. 52. fig. 2.

D. 12. A. 6. V. 8.

Caudal fin rounded; upper margin of the dorsal fin oblique, straight. The length of the head is one-fourth of the total (without caudal). Snout produced, with a short, blunt spine above its end. Body without marks; dorsal and caudal fins with transverse stripes. (*M'Clell.*)

Assam.

2. *Caudal fin distinctly emarginate.*

30. Nemachilus insignis.

Cobitis insignis, *Heckel, in Russegger's Reisen,* i. p. 1087, taf. 12. fig. 3.

D. 10. A. 7. V. 7.

Caudal fin conspicuously emarginate. Origin of the dorsal fin midway between the end of the snout and the root of the caudal. The height of the body is considerably less than the length of the head, which is one-fifth of the total (without caudal). The depth of the free portion of the tail is one-half of its length. Snout produced, rather pointed, its length being more than that of the postorbital portion of the head. Eye of moderate size, its diameter being a little less than the width of the interorbital space. Length of the pectoral fin rather more than one-half of the distance of its root from the ventral. Upper margin of the dorsal fin straight, oblique. Body mottled with blackish, the spots forming sometimes irregular bands across the back of the tail.

Syria.

a. Several adult and half-grown specimens. Dead Sea. From the Collection of the Rev. H. B. Tristram.

b. Several young examples. Jacob's Well. From the Collection of the Rev. H. B. Tristram.

31. Nemachilus argyrogramma.

Cobitis argyrogramma, *Heckel, in Russegger's Reisen*, ii. p. 239, taf. 18. fig. 3.

D. 12. A. 7. V. 7.

Caudal fin slightly emarginate. The origin of the dorsal fin is a little nearer to the end of the snout than to the root of the caudal. The height of the body is nearly equal to the length of the head, which is two-ninths of the total (without caudal). Snout of moderate length, obtuse, rather shorter than the postorbital portion of the head. Eye small. Length of the pectoral fin much more than one-half of the distance of its root from the ventral. Upper margin of the dorsal fin straight, oblique. Body with ten or twelve irregular brown cross bands, interrupted by the silvery lateral line. A black streak from the eye to the end of the snout. (*Heck.*)

Aleppo.

32. Nemachilus frenatus.

Cobitis frenata, *Heckel, in Russegger's Reisen*, i. p. 1086, taf. 12. fig. 1.

D. 11. A. 7. V. 7.

Caudal fin slightly emarginate. Origin of the dorsal fin nearly midway between the end of the snout and the root of the caudal. The height of the body is scarcely less than the length of the head, which is nearly one-fifth of the total (without caudal). Snout short, obtuse, much shorter than the postorbital portion of the head. Eye rather small. Length of the pectoral about one-half of the distance of its base from the ventral. Upper margin of the dorsal fin straight, not very oblique. A black band runs from one eye, round the end of the snout, to the other; hinder part of the body and caudal fin mottled with brown. (*Heck.*)

River Tigris.

33. Nemachilus stolickæ.

Cobitis stolickæ, *Steindachner, Verh. zool.-bot. Ges. Wien*, 1866, p. 793, taf. 14. fig. 2.

D. 10–11. A. 7–8. V. 8.

Scaleless. Caudal fin slightly emarginate. The origin of the dorsal fin is conspicuously nearer to the root of the caudal than to the end of the snout. The height of the body is considerably less than the length of the head, which is a little more than one-fifth of the total (without caudal). The free portion of the tail is low, its depth being two-fifths of its length. Eye not very small, two-elevenths of the length of the head. The length of the pectoral is not much more than one-half of the distance of its base from the ventral. Upper margin of the dorsal fin oblique, with the upper corner rounded. Upper part of the side, and dorsal, caudal, and pectoral fins, marbled with darker. (*Steindachner.*)

Lake Tsumureri in the province of Rupshu (Tibet), 15,500 feet above the level of the sea.

34. Nemachilus griffithii.

D. 10. A. 7. V. 8.

Scales. Caudal fin emarginate. The origin of the dorsal fin is midway between the root of the caudal and the end of the snout. The height of the body is considerably less than the length of the head, which is one-fifth of the total length (without caudal). The free portion of the tail is very low, its depth being one-third, or rather less than one-third, of its length. Eye small, one-seventh of the length of the head. Snout produced, obtuse, as long as the postorbital portion of the head. The length of the pectoral is not much more than one-half of the distance of its base from the ventral. Upper margin of the dorsal fin oblique, straight, with the upper corner slightly rounded. Sides of the body, and dorsal and caudal fins, irregularly marbled with brownish black. Several bars of the same colour, rather distant from one another, across the back.

Assam?

a–b. Five and a half inches long. From Griffith's Collection.

35. Nemachilus turio.

Cobitis turio, *Ham. Buch. Fish. Gang.* p. 358.
—— gibbosa, *M'Clell. Ind. Cypr.* pp. 304, 436, tab. 52. fig. 7 (cop. from *Buchanan's MS.*).
? Cobitis arenata, *Valenc. in Jacquem. Voy. Ind. Poiss.* pl. 15. fig. 1; *Cuv. & Val.* xviii. p. 28.

D. 8 (10?). A. 6–7.

Caudal fin emarginate. Back elevated, the height of the body being equal to the length of the head, and one-fourth of the total (without caudal). The free portion of the tail is very short. Eye of moderate size. Pectoral fin terminating at a short distance from the ventral. Body with irregular dark spots.

Hindostan.

36. Nemachilus corica.

Cobitis corica, *Ham. Buch. Fish. Gang.* p. 359.

Schistura punctata, *M'Clell. Ind. Cypr.* pp. 308, 442, pl. 53. fig. 4 (cop. from *Buchanan's MS.*).

D. 10. A. 7. V. 7.

Caudal fin conspicuously emarginate; upper margin of the dorsal fin straight, oblique. A series of about eleven round dark spots along the lateral line, and a similar row along the back.

North-eastern Bengal; Assam.

37. Nemachilus guentheri.

Nemacheilus guentheri, *Day, Proc. Zool. Soc.* 1867, p. 285.

D. 10. A. 7. V. 7.

Scales conspicuous. Caudal fin distinctly emarginate, with the lobes pointed. Origin of the dorsal fin midway between the end of the snout and the root of the caudal. The height of the body is much less than the length of the head, which is two-ninths of the total (without caudal). Head rather narrow; snout somewhat pointed, of moderate length, shorter than the postorbital portion of the head; eye small. Upper margin of the dorsal fin straight, oblique; the length of the pectoral fin is three-fifths of the distance of its base from the ventral. Free portion of the tail longer than deep. Yellowish, coarsely reticulated with brown, the yellow ground-colour forming two series of round spots on the tail, one above and the other below the lateral line. Dorsal fin with three series of black dots; caudal fin nearly immaculate.

Nilgherries.

a. One of the typical specimens. From Mr. Day's Collection.

APPENDIX.

M'Clelland mentions two other very small species, said to have four barbels only, which requires confirmation:—

Cobitis guttata.

M'Clell. Ind. Cypr. pp. 305, 438, pl. 52. figs. 5, 6.

D. 8. Caudal fin subtruncate. Green above, silvery below; body dotted.

Vicinity of Joorhath.

Cobitis phoxochila.

M'Clell. Ind. Cypr. pp. 305, 449, pl. 52. fig. 4.

D. 8. Head much compressed, raised obliquely; ridge between the eyes sharp and bony. A dark nebulous streak extends along the lateral line. Caudal fin round, crossed by several small bars.

Mishmee Mountains.

100. COBITIS[*].

Cobitis, sp., *Artedi.*

Botia, sp., *Gray, Zool. Misc.* p. 8.

Acanthopsis, *Agassiz, Mém. Soc. Sc. Nat. Neuchâtel,* i. p. 36 (not *Van Hass.*).

Somileptes *et* Cobitis, *Bleeker.*

Body more or less compressed, elongate; back not arched. A small, erectile, bifid suborbital spine below the eye. Six barbels only on the upper jaw. Dorsal fin inserted opposite to ventrals; caudal rounded or truncate. Air-bladder enclosed in a bony capsule.

Europe; East-Indian continent.

1. Cobitis tænia.

Spinous Loach, Groundling. Der Steinpizger.

Cobitis aculeata, *Rondel.* ii. p. 204; *Aldrov.* v. p. 617; *Gesner,* pp. 404, 482; *Jonston,* iii. tit. 1, c. 12. a. 2, t. 26. f. 21; *Willughby, Hist. Pisc.* p. 265, tab. Q. 8. fig. 3.

Tænia cornuta, *Willughby, l. c.* p. 266.

Marsil. Danub. Pan.-Mys. p. 3, tab. 4. fig. 2.

Cobitis, sp., *Artedi, Genera,* p. 2. no. 1; *Species,* p. 4. no. 1; and *Synon.* p. 3. no. 2; *Gronov. Zoophyl.* no. 202.

Cobitis tænia, *L. Syst. Nat.* i. p. 499; *Bl. Fische Deutschl.* i. p. 221, tab. 31. fig. 2; *Bl. Schn.* p. 434; *Lacép.* v. p. 9; *Pallas, Zoogr. Ross.-As.* iii. p. 166; *Müller, Prodr. Zool. Dan.* p. 47; *Meidinger,* tab. 32; *Turton, Brit. Faun.* p. 103; *Fleming, Brit. An.* p. 189; *Jenyns, Man.* p. 417; *Nilss. Skand. Faun. Fisk.* p. 345; *Cuv. & Val.* xviii. p. 58; *Heck. & Kner, Süsswasserf.* p. 303. fig. 163; *Siebold, Süsswasserf.* p. 338; *Malmgren, Wiegm. Arch.* 1864, p. 306; *Steindachner, Sitzgsber. Ak. Wiss. Wien,* 1865, Nov. 3 & 30; *Canestrini, Arch. p. la Zool. etc.* iv. 1866, p. 148; *Blanchard, Poiss. France,* p. 285.

Spinous Loche, *Pennant, Brit. Zool.* ed. 1812, iii. p. 381.

Botia tænia, *Yarrell, Brit. Fish.* i. p. 381; 2nd edit. i. p. 432; 3rd edit. i. p. 452; *Kröyer, Danm. Fisk.* iii. p. 564; *Couch, Brit. Fish.* iv. p. 72, c. fig. pess.

Acanthopsis tænia, *Agassiz, Mém. Soc. Sc. Neuchâtel,* i. p. 36; *Sélys-Longch. Faune Belge,* p. 192; *Nordm. in Demidoff Voy. Russ. Mérid.* iii. p. 468; *Jeitteles, Fische d. March,* i. 1863, p. 18.

Cobitis (Acanthopsis) caspia, *Eichwald, Bull. Soc. Nat. Mosc.* 1838, ii. p. 133; and *Faun. Casp.-Caucas.* p. 160.

—— tænia japonica, *Schleg. Faun. Japon. Poiss.* p. 222, pl. 103. figs. 3 & 3 *a.*

—— elongata, *Heck. & Kner, Süsswasserf.* p. 305. fig. 164.

Cobitis barbatula, *Gronov. Syst.* ed *Gray,* p. 41 (not *auct.*).

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[*] 1. Acanthopsis linea. *Heckel, in Russegger's Reisen,* ii. 3. p. 267.—Persepolis.

2. —— berdmorei, *Blyth, Journ. As. Soc. Bengal,* 1860, p. 168.—Tennasserim.

3. —— micropogon, *Blyth, l. c.*—Tennasserim. This species is described as having "the tail furcate."

Cobitis larvata, *De Filippi, Mem. Accad. Torin.* xix. p. lxxi; *Canestrini, Arch. p. la Zool.* iv. 1866, p. 152.

D. 10. A. 7. V. 6.

Body much compressed. Barbels very short; eye small, in the middle of the length of the head. Scales inconspicuous. The origin of the dorsal fin is somewhat in advance of that of the ventrals. A series of large brown spots (sometimes confluent into a band) along the side of the body. A brown streak from the eye to the end of the snout; a black spot on the upper part of the root of the caudal.

Europe; Japan.

a. Half-grown. Holland. From Dr. Bleeker's Collection.
b. Adult: skin. Holland. From Gronow's Collection.
c. Adult. Bavaria. From Dr. Gemminger's Collection.
d. Half-grown. River Gotha (Sweden). Purchased of Mr. Lloyd.

Acanthopsis aurata, De Filippi, Viaggio in Persia, p. 360, is characterized thus:—Habitus *Acanth. tæniæ*, sed corpore longiore, cirris longioribus, aculeo infraorbitali cum diametri verticalis oculi prolongatione coincidente. Corporis lateribus et abdomine nitide auratis.—Neighbourhood of Sartschem.

2. Cobitis guntea.

Cobitis guntea, *Ham. Buch. Fish. Gang.* p. 353; *M'Clell. Ind. Cypr.* pp. 303, 434, tab. 51. fig. 3 (copied from *Buchanan's MS. drawings*).

D. 9. A. 7. V. 7.

Body moderately compressed Barbels well developed. Eye rather small. The origin of the dorsal fin is somewhat in advance of the ventrals. Three series of spots (each composed of dots) along the side of the body, those of the middle series confluent into a band. Dorsal and caudal fins with numerous brownish dots. (*Buch.*)

Assam and Bengal.

3. Cobitis gongota.

Cobitis gongota, *Ham. Buch. Fish. Gang.* p. 351.
—— cucura, *Ham. Buch. l. c.* p. 352; *M'Clell. Ind. Cypr.* pp. 303, 434, tab. 51. fig. 2 (copied from *Buchanan's MS. drawings*) (young).
—— oculata, *M'Clell. Ind. Cypr.* pp. 303, 433, tab. 51. fig. 1. (copied from *Buchanan's MS. drawings*).
? Cobitis maya, *Sykes, Trans. Zool. Soc.* ii. p. 367.
? Cobitis amnicola, *Cuv. & Val.* xviii. p. 68.
Somileptes gongota, *Swainson & Bleeker, Atl. Ichthyol. Cypr.* p. 3 (name only).

D. 10. A. 8. V. 7.

Body moderately compressed. Barbels moderately developed. Eye small, prominent, somewhat before the middle of the length of the head. Scales inconspicuous. The origin of the dorsal fin is in the vertical from the root of the inner ventral ray. A more or less distinct, undulated band along the side of the body, emitting vertical bars towards the back. Dorsal and caudal fins with transverse rows of blackish dots.

Assam and Bengal.

a. Not in good state. Presented by Lieut.-Col. Playfair.

101. LEPIDOCEPHALICHTHYS.

Lepidocephalichthys, *Bleek. Atl. Ichthyol.* p. 12.
Platacanthus, *Day, Proc. Zool. Soc.* 1865, p. 296.

Body slightly compressed, oblong, back not arched. A small, erectile, bifid, suborbital spine below the eye. Eight barbels, two of them belonging to the mandible. Dorsal fin inserted opposite, or nearly opposite, to ventrals; caudal truncate. Air-bladder enclosed in a bony capsule.

East Indies.

This genus is very closely allied to *Cobitis*. The air-bladder, the presence of which is denied by Bleeker and Day, is, on the contrary, comparatively very large.

1. Lepidocephalichthys hasseltii.

Cobitis hasseltii, *Cuv. & Val.* xviii. p. 74; *Bleek. Nat. Tydschr. Ned. Ind.* xiii. p. 365.
Lepidocephalus hasseltii, *Bleek. Prodr. Cypr.* p. 71.
Lepidocephalichthys hasseltii, *Bleek. Atl. Ichthyol. Cypr.* p. 13, tab. 2. fig. 2.

D. 9. A. 7. V. 7.

The origin of the dorsal fin is opposite to the base of the inner ventral ray, and somewhat nearer to the root of the caudal than to the end of the snout. Caudal fin truncate. Rather irregularly spotted and dotted with brown. Sometimes a blackish spot superiorly on the base of the caudal.

Java.

a. Adult. From Dr. Bleeker's Collection.

2. Lepidocephalichthys thermalis.

Cobitis thermalis, *Cuv. & Val.* xviii. p. 78.
Lepidocephalichthys thermalis, *Bleek. in Verh. Holland. Maatsch. Haarlem*, 1864, *Cyprin. & Cobit. Ceyl.* p. 6, tab. 1. fig. 1.
Platacanthus agrensis, *Day, l. c.*; or *Fish. Malabar*, p. 204, pl. 14. fig. 2 (bad).

D. 9. A. 7. V. 7.

The origin of the dorsal fin is in advance of the root of the ventrals, and nearer to the root of the caudal than to the end of the snout. Caudal fin truncate, with the corners pointed. Scales conspicuous. A series of about twelve round brown spots along the lateral line; back mottled with brown. A black white-edged ocellus superiorly at the base of the caudal. Dorsal rays with black dots; caudal fin crossed by four bands. A streak runs from the eye to the end of the snout.

Ceylon; Southern India.

a, b, c. Many specimens. Ceylon.

d, e–g. Typical specimens of *Platacanthus agrensis.* Coast of Malabar. From Mr. Day's Collection.

The male has the inner pectoral ray modified into a flat semi-osseous spine, which, however, is attached to the fin by the usual interradial membrane, and not detached, as erroneously represented in the figure given by Mr. Day.

3. Lepidocephalichthys balgara.

Cobitis balgara, *Ham. Buch. Fish. Gang.* p. 356.
Schistura balgara, *M'Clell. Ind. Cypr.* p. 307, pl. 53. fig. 2 (copied from *Buchanan's MS. drawings*).
—— aculeata, *M'Clell. l. c.*

D. 8. A. 7.

Origin of the dorsal fin opposite to that of the ventrals. Caudal fin truncate. Back and sides irregularly mottled with brown. (*Buch.*)

Kosi River; Assam.

102. ACANTHOPSIS.

Acanthopsis, *Van Hasselt, Algem. Konst- en Letterb.* ii. 1823. p. 133.
Prostheacanthus, *Blyth, Journ. As. Soc. Bengal,* 1860, p. 167.

Body much elongate; snout compressed, very long; a small erectile bifid suborbital spine situated in advance of the eye. Barbels eight, two of them belonging to the mandible. Dorsal fin opposite to ventrals; caudal bilobed. Air-bladder enclosed in a bony capsule.

East-Indian archipelago; Tennasserim.

1. Acanthopsis chœrorhynchus.

Cobitis choirorhynchos, *Bleek. Nat. Tydschr. Ned. Ind.* vii. p. 95.
? Prostheacanthus spectabilis, *Blyth, Journ. As. Soc. Bengal,* 1860, p. 167.
Acanthopsis choirorrhynchus, *Bleek. Cypr. Prodr.* p. 66; or *Atl. Ichthyol. Cypr.* p. 9, tab. 1. fig. 3.

D. 12. A. 8. V. 7.

Scales inconspicuous. Snout nearly twice as long as the remainder of the head. Lower caudal lobe longer than upper. Back with from twelve to fourteen dark cross bars, lateral line with a series of from ten to twelve round spots; a black spot on the base of the upper caudal lobe.

Sumatra; ? Tennasserim.

a. Type of the species. From Dr. Bleeker's Collection.

2. Acanthopsis dialyzona.

Acanthopsis dialyzona, *Van Hasselt, Algem. Konst- en Letterb.* 1823, ii. p. 133; *Bleek. Cypr. Prodr.* p. 67; or *Atl. Ichthyol. Cypr.* p. 9, tab. 9. fig. 8.

Cobitis macrorhynchos, *Bleek. Nat. Tydschr. Ned. Ind.* vii. p. 96; or *Act. Soc. Sc. Indo-Neerl.* ii. *Borneo*, x. p. 20.

D. 12. A. 8. V. 7.

Scales inconspicuous; snout not twice as long as the remainder of the head. Lower caudal lobe a little longer than the upper. Coloration uniform.

Java and Borneo.

a–f. Adult. Java.
g. Adult. From Dr. Bleeker's Collection.

103. BOTIA[*].

Botia, sp., *Gray, Zool. Misc.* p. 8.
Hymenophysa, *M'Clell. Ind. Cypr.* p. 443.

Body compressed, oblong; back more or less arched. Eyes with a free circular eyelid; an erectile bifid suborbital spine. Six barbels on the upper jaw, sometimes two others at the mandibulary symphysis. Dorsal fin commencing in advance of the root of the ventrals; caudal forked. Air-bladder consisting of two divisions: the anterior enclosed in a partly osseous capsule, the posterior free, floating in the abdominal cavity (*H. modesta*).

East Indies.

1. Botia dario.

Cobitis dario, *Ham. Buch. Fish. Gang.* p. 354, pl. 29. fig. 95; *Bleek. Verh. Bat. Gen. Nederl. Ind.* xxv. *Beng. & Hind.* p. 143.

—— geto, *Ham. Buch. l. c.* p. 355, pl. 11. fig. 96 (young); *Cuv. & Val.* xviii. p. 81.

D. 13. A. 8. V. 9.

Barbels eight. The height of the body is equal to the length of the head, and contained thrice and three-fourths in the total (without caudal); snout rather obtuse, not much longer than the remainder of the length of the head. Suborbital spine extending to, or nearly to, below the hind margin of the orbit. Interorbital space broad, about twice as wide as the orbit. Body with seven or eight broad, oblique, brown cross bands, which are of a deeper colour in the young than in the adult, in which they are sometimes divided into two. Each caudal lobe with three oblique brown cross bars. Dorsal and anal without, or with an indistinct, cross band.

Bengal and Assam.

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[*] 1. Botia nebulosa, *Blyth, Journ. As. Soc. Beng.* 1860, p. 165.—Darjiling.
2. —— histrionica, *Blyth, l. c.* p. 166.—Tennasserim.
3. Syncrossus berdmorei, *Blyth, l. c.*—Tennasserim.—Is this fish a *Botia*? Blyth says, in the diagnosis of this genus *Syncrossus*, "A forked spine *anterior* to the eye;" yet he refers to it "*Schistura grandis* of M'Clelland," which has "two strong prickles beneath each eye.

a. Half-grown. Ganges. From M'Clelland's Collection.
b. Young: bad state. River Hooghly. From Dr. Bleeker's Collection.
c–d. Half-grown. Cachar. Presented by Lieut.-Col. Playfair.

2. Botia almorhæ.

Botia almorhæ, *Gray, Zool. Misc.* 1831, p. 8.
—— grandis, *Gray & Hardw. Ind. Zool.* c. fig.

D. 12. A. 8. V. 8.

Barbels eight. The height of the body is a little less than the length of the head, which is one-fourth of the total (without caudal); snout pointed, its length being rather more than that of the remaining part of the head. Suborbital spine extending to, or nearly to, below the hind margin of the orbit. Interorbital space rather narrow, not twice as wide as the orbit, which is small. Body reticulated with brown, the yellow ground-colour being broken up into yellow spots; all the fins with more or less regular brown cross bands, three or four on each caudal lobe, three across the anal fin, and about six across the pectoral.

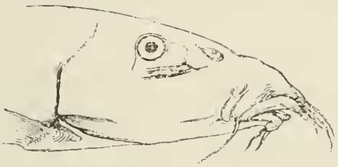
India.

a. Type of the species. Presented by General Hardwicke.
b. Adult. From the Collection of the East-India Company.

3. Botia rostrata.

D. 12. A. 8. V. 8.

Barbels eight The height of the body is one-fourth or one-fifth of the total length (without caudal), the length of the head two-sevenths. Snout very long, pointed, its length being considerably more than that of the remaining part of the head. Suborbital spine not extending to below the hind margin of the orbit. Interorbital space narrow, not twice as wide as the orbit, which is small. Origin of the dorsal fin midway between the root of the caudal and nostril. Caudal fin deeply forked. Body with irregular and partly confluent brown cross bands, which enclose larger and smaller round whitish spots. Dorsal and anal fins with two, pectoral, ventral, and each caudal lobe with three brown cross bands.



Assam (?); Bengal.

a. Five inches long. Assam? From Dr. Griffith's Collection.
b. Three inches long. Ganges. From Dr. M'Clelland's Collection.

4. Botia macracanthus.

Cobitis macracanthus, *Bleek. Nat. Tydschr. Ned. Ind.* iii. p. 603.
Hymenophysa macracanthus, *Bleek. Cypr. Prodr.* p. 62.
Botia macracanthus, *Bleek. Atl. Ichthyol. Cypr.* p. 5, tab. 1. fig. 1.

D. 11. A. 8. V. 8–9.

Barbels eight. The height of the body is more than the length of the head, which is one-third of the total (without caudal). Snout compressed, deep, the small eye being entirely situated in the posterior half of the head. Suborbital spine long, extending to, or somewhat beyond, the hind margin of the orbit. Head and body with three very broad brown transverse bands.

Sumatra and Borneo.

a. Type of the species. Sumatra. From Dr. Bleeker's Collection.
b. Young. Presented by Dr. A. Günther.

5. Botia modesta.

Botia modesta, *Bleek. Nederl. Tydschr. Dierk.* 1864, p. 11.

D. 11. A. 8. V. 8.

Barbels six. The length of the head is nearly equal to the height of the body, which is one-third of the total (without caudal), the tail being very short and deep. Snout rather pointed, scarcely longer than the remaining portion of the head. Suborbital spine extending to, or nearly to, the hind margin of the orbit. Body and fins immaculate; sometimes a blackish spot across the upper part of the root of the caudal.

Siam.

a, *b*, *c–d*. Fine specimens. Pachebon. From M. Mouhot's Collection.

6. Botia curta.

Cobitis curta, *Schleg. Faun. Japon. Poiss.* p. 223, tab. 103. fig. 4.
Hymenophysa curta, *Bleek. Cypr. Prodr.* p. 56 (name only).

D. 9. A. 6.

Barbels six. The height of the body is two-ninths of the total length (without caudal), the length of the head one-fourth; snout pointed, the eye occupying the middle of the length of the head. Interorbital space narrow. Body immaculate; dorsal fin with a blackish spot anteriorly at the base, and with a cross band in its upper half; anal with one, each caudal lobe with two blackish cross bands. (*Schleg.*)

Japan.

7. Botia hymenophysa.

Cobitis hymenophysa, *Bleek. Nat. Tydschr. Ned. Ind.* iii. p. 602.
Hymenophysa macclellandii, *Bleek. Cypr. Prodr.* p. 63.
Botia hymenophysa, *Bleek. Atl. Ichth. Cypr.* p. 6, tab. 1. fig. 2.

D. 13–15. A. 8. V. 8.

Barbels six. The height of the body is contained nearly four times in the total length (without caudal), the length of the head thrice and one-third. Snout much pointed, a little longer than the remaining portion of the head. Suborbital spine small, extending only to below the middle of the eye. Interorbital space narrow, not much wider than the orbit. Body with from thirteen to fifteen brownish cross bars edged with blue (in preserved examples the bluish edges only are visible). Dorsal and caudal fins with transverse lines, the former generally with a blackish blotch on its antero-superior angle.

Java; Sumatra; Borneo; Siam.

a. Type of the species. From Dr. Bleeker's Collection.
b–e. Adult and young. Java.

A *variety* of this species from Siam has only eleven cross bands, which do not appear to be edged with blue, and the last cross band terminates in a black spot superiorly on the root of the caudal fin.

a–b. Fine specimens. Pachebon (Mouhot). Purchased of Mr. Stevens.

104. OREONECTES.

Head depressed, body scarcely compressed. No spine below the eye. Six barbels round the upper jaw. Dorsal fin placed far backwards, at some distance behind the root of the ventrals; caudal fin rounded. Air-bladder enclosed in a paired bony capsule.

China.

1. Oreonectes platycephalus.

D. 9. A. 7. V. 8.

Scales very conspicuous. Body but slightly compressed, its depth being one-sixth or one-seventh of the total length (without caudal). Head much depressed, its length being nearly one-fifth of the total (without caudal); interorbital space very broad and flat. Snout depressed, shorter than the postorbital portion of the head. Eyes very small. Barbels well developed. Origin of the dorsal fin considerably nearer to the root of the caudal than to the opercle. Caudal longer, pectoral rather shorter than the head; ventral extending to the vent. A brown band across the root of the caudal.

China.

a, b, c. Many specimens, to $2\frac{2}{3}$ inches long. From a small stream near the top of Hongkong Mountains (?), 15,000 feet above the level of the sea.

105. LEPIDOCEPHALUS.

Lepidocephalus, sp., *Bleek. Prodr. Cypr.* p. 68.
Lepidocephalus, *Bleek. Atl. Ichthyol. Cypr.* p. 12.

Body compressed, elongate. An erectile bifid suborbital spine below the eye. Six barbels, viz. four on the extremity of the snout and the two others attached to the maxillaries. Dorsal fin placed far backwards, at some distance behind the root of the ventrals; caudal truncate.

East-Indian archipelago.

1. Lepidocephalus macrochir.

Cobitis macrochir, *Bleek. Nat. Tydschr. Ned. Ind.* vii. p. 97.
Lepidocephalus macrochir, *Bleek. Cypr. Prodr.* p. 70; or *Atl. Ichthyol. Cypr.* p. 12, tab. 2. fig. 6.

D. 9. A. 6. V. 6.

The height of the body is equal to, or rather more than, the length of the head, which is one-sixth or two-thirteenths of the total (without caudal). The distance between dorsal and caudal is two-ninths of the same length. Eye almost rudimentary. Coloration uniform.

Java and Sumatra.

a. Type of the species. From Dr. Bleeker's Collection.

106. ACANTHOPHTHALMUS.

Acanthophthalmus, sp., *v. Hasselt, Algem. Konst- en Letterb.* 1823, ii. p. 133.
Pangio, *Blyth, Journ. As. Soc. Bengal*, 1860, p. 169.
Acanthophthalmus*, *Bleeker, Cypr. Prodr.* p. 73.

Body compressed, elongate. A small, erectile bifid suborbital spine below the eye. Six barbels, viz. two on the extremity of the snout, and the others attached to the maxillaries. Dorsal fin placed far backwards, at some distance behind the root of the ventrals; caudal truncate. Air-bladder enclosed in a bony capsule.

East Indies.

1. Acanthophthalmus pangia.

Cobitis pangia, *Ham. Buch. Fish. Gang.* p. 355.
—— cinnamomea, *M'Clell. Ind. Cypr.* p. 435, pl. 51. fig. 5 (cop. from *Buchanan's MS. drawings*).
—— oblonga, (*Kuhl & v. Hass.*) *Cuv. & Val.* xviii. p. 76; *Bleek. Act. Soc. Sc. Indo-Neerl.* ii. *Sumatra*, vi. p. 48.
Pangio cinnamomea, *Blyth, Journ. As. Soc. Beng.* 1860, p. 169.
Acanthophthalmus javanicus, (*v. Hass.*) *Bleek. Cypr. Prodr.* p. 75; or *Atl. Ichthyol. Cypr.* p. 11, tab. 2. fig. 3.

D. 8. A. 7. V. 6–7.

The length of the head is a little more than one-seventh of the total length (without caudal). Eye almost rudimentary. Caudal fin subtruncate. The distance between dorsal and caudal fins is about one-fourth of the total length (without caudal). Scales conspicuous. Coloration uniform.

Bengal; Java; Sumatra.

a. From Dr. Bleeker's Collection.

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* Dr. Bleeker is rather inconsistent in choosing the name of *Acanthophthalmus* for this genus, a name proposed by his countryman Van Hasselt. The first and (according to Dr. Bleeker's most recent principles) typical species of *Acanthophthalmus* is *Cobitis octocirrhus* (v. Hass.). Yet he proposes for the latter the generic name *Lepidocephalichthys*, thus getting rid of Blyth's *Pangio*. I adopt *Acanthophthalmus* simply because its adoption necessitates the least amount of change in nomenclature.—The air-bladder, the presence of which is denied by Bleeker in these and other species, is present.

What we know, at present, of the characters of continental and archipelagic individuals would not justify us in separating them specifically. Blyth's description of the barbels is more accurate than that of Buchanan, and agrees with examples from Java or Sumatra.

2. **Acanthophthalmus kuhlii.**

Acanthophthalmus fasciatus, *v. Hasselt, l. c.* (no description).
Cobitis kuhlii, *Cuv. & Val.* xviii. p. 77; *Bleek. Nat. Tydschr. Ned. Ind.* xiii. p. 364.
Acanthophthalmus fasciatus, *Bleek. Cypr. Prodr.* p. 74; or *Atl. Ichthyol. Cypr.* p. 11, tab. 2. fig. 4.

D. 8. A. 6–7. V. 6.

The length of the head is one-seventh or one-eighth of the total length (without caudal). Eye very small. Caudal fin truncate. The distance between dorsal and caudal fins is about one-fourth of the total length (without caudal). Scales conspicuous. Body with from eleven to fifteen brown cross bands.

Java and Sumatra.

a. From Dr. Bleeker's Collection.

107. APUA.

Apua*, *Blyth, Journ. As. Soc. Beng.* 1860, p. 169.

Much like *Acanthophthalmus*, but without ventral fins.

Tennasserim.

1. **Apua fusca.**

Blyth, l. c.

D. 7–8. A. 6.

Uniform dull brown: $2\frac{1}{2}$ in. long, $\frac{1}{4}$ in. deep; head $\frac{5}{16}$ in. (*Blyth.*)

Tennasserim.

We would here draw attention to a fish from Borneo, named *Aperioptus pictorius* by Richardson, and figured in the 'Zoology of the Voyage of the Samarang,' Fish. pl. 10. fig. 4. Unfortunately the specimens were lost, so that no description could be given of them. The fish has the form of a *Lepidocephalus*, the dorsal being placed far backwards, nearly opposite to the ventrals. But the mouth is represented as transverse, curiously lobed, and without barbels.

APPENDIX TO CYPRINIDÆ.

The fresh waters of tropical Africa are inhabited by a very singular fish, most probably the type of a distinct family, which I should not hesitate to introduce into the system but for the circumstance that I have only three examples of this minute form for examination, and that they are not in a good state of preservation, so that a part of the diagnosis given here may be modified at a later period.

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* What is the meaning of this word? It appears to have been suggested by ἀ and πούς!

KNERIIDÆ. Body scaly, head naked. Margin of the upper jaw formed by the intermaxillaries. Dorsal and anal fins short, the forme belonging to the abdominal portion of the vertebral column. Teeth none, either in the mouth or pharynx. Barbels none. Stomach without blind sac; no pyloric appendages. Pseudobranchiæ none; branchiostegals three; air-bladder long, not divided; ovaries closed.

The single genus which would be the type of this family has lately been described by Dr. Steindachner as an "Acanthopsoid" form; however, its similarity to the Loaches is merely superficial.

KNERIA.

Kneria, *Steindachner, Verhandl. zool.-bot. Gesellsch. Wien,* 1866, p. 769.

Body elongate, subcylindrical, covered with very small cycloid scales; snout depressed, upper jaw protruding beyond the mouth, which is small, inferior, transverse. The intermaxillaries, as well as the mandibles, form a very sharp edge, the lower jaw being without lip, whilst the edge of the upper is overlapped by a fold of the skin of the snout. Eye rather small. Gill-membranes entirely grown to the isthmus, the gill-opening being a rather narrow vertical slit. Dorsal fin opposite, or nearly opposite, to ventral; caudal emarginate. Air-bladder long, cylindrical, externally showing a series of slight swellings, but without divisions in its interior. Intestinal tract with several convolutions. Ova small.

Tropical Africa.

1. Kneria angolensis.

Steindachner, l. c. p. 770, taf. 17. f. 1.

D. 9. A. 11. V. 9.

The height of the body is less than the length of the head, which is one-sixth of the total (without caudal); the diameter of the eye is contained thrice and two-thirds in the length of the head. The dorsal fin commences behind the ventrals. A black spot at the base of the ventrals and pectorals, two at the base of the anal. (*St.*)

Angola.

2. Kneria spekii.

D. 9. A. 8. V. 9.

The height of the body is less than the length of the head, which is one-sixth of the total (without caudal); the diameter of the eye is one-fifth of the length of the head. Origin of the dorsal fin midway between the end of the snout and the root of the caudal, and opposite to the root of the ventral. Pectorals longer than ventrals, but shorter than the head. Uniform brown.

Central Africa.

a–c. Adult females, 27 lines long. Uzaramo. Presented by the late Capt. Speke.

Fam. 18. GONORHYNCHIDÆ.

Head and body entirely covered with spiny scales; mouth with barbels. Margin of the upper jaw formed by the intermaxillary, which, although short, is continued downwards as a thick lip, situated in front of the maxillary. Adipose fin none; the dorsal fin is opposite to the ventrals, and short, like the anal. Stomach simple, without blind sac; pyloric appendages in small number. Pseudobranchiæ; air-bladder absent. Gill-openings narrow.

Southern temperate parts of the Atlantic and Pacific; Japan.

Only one genus is known.

1. GONORHYNCHUS.

Gonorhynchus, *Gronov. Zoophyl.* no. 199; *Cuv. & Val.* xix. p. 202; *Kner, Novara, Fisch.* p. 342.
Rhynchana, *Richards. Voy. Ereb. & Terr. Fish.* p. 44.

Body elongate, subcylindrical; head pointed; snout conically projecting beyond the mouth (which is inferior, subsemicircular). A single barbel behind the end of the snout; lips thick, fringed. Eye large, covered by the transparent skin. Teeth none in the jaws or on the palate; two patches of obtuse teeth behind the palate, on the pterygoid bones, opposed to a single larger patch on the hyoid. A lobe of the mucous membrane is suspended from the roof of the mouth, in front of the teeth. Dorsal fin opposite to the ventrals, these fins being approximate to the vent; caudal fin subtruncate. Gill-membranes grown to the isthmus. A fringed gill-like organ behind the fourth branchial arch, one half being attached to this arch, the other half to the humeral arch. Branchiostegals four.

Cape of Good Hope; Australian and Japanese seas.

1. Gonorhynchus greyi.

Gonorhynchus, *Gronov. Zoophyl.* no. 199, tab. 10. fig. 2 (bad).
Cyprinus gonorynchus, *Gm. L.* i. p. 1422; *Bl. Schn.* p. 443, tab. 78. fig. 1 (copied from *Gronov.*); *Lacép.* v. p. 570.
Rhynchana greyi, *Richards. l. c.* pl. 29. figs. 1–6.
Gonorhynchus abbreviatus, *Schleg. Faun. Japon. Poiss.* p. 217, pl. 103. fig. 5.
—— gronovii, *Schleg. l. c.*; *Cuv. & Val.* xix. p. 207, pl. 568.
—— greyi, *Cuv. & Val.* xix. p. 212.

Cobitis gonorynchus, *Gronov. Syst.* ed. *Gray*, p. 41.
Gonorhynchus brevis, *Kner, Novara, Fisch.* p. 342, taf. 16. fig. 1.

B. 4. D. 11–13. A. 9. V. 9. Cæc. pyl. 6–9.

Scales very small. The height of the body is about one-half of the length of the head, which is from two-ninths to one-sixth of the total length (without caudal). Terminal portion of the fins black, edged with white.

Cape of Good Hope, Australia, New Zealand, Japan.

a. Adult: skin. Cape of Good Hope. From Gronow's Collection.
b. Fine specimen. West Australia. From the Haslar Collection. Type of *G. greyi*.
c. Adult: stuffed. West Australia. Presented by Sir G. Grey.
d. Adult: stuffed. South Australia. Purchased.
e. Fine half-grown specimen. Melbourne. Presented by G. Krefft, Esq.
f. Adult. Port Nichols, New Zealand. Presented by the Royal College of Surgeons.
g. Half-grown.

From an examination of these specimens I have arrived at the conclusion that this species varies considerably in the depth of the body, and especially that young examples are constantly less elongate than adult.

Fam. 19. HYODONTIDÆ.

Body covered with cycloid scales; head naked; barbels none. Margin of the upper jaw formed by the intermaxillaries mesially, and by the maxillaries laterally, the latter being articulated to the end of the former. Opercular apparatus complete. Adipose fin none; the dorsal fin belongs to the caudal portion of the vertebral column. Stomach horseshoe-shaped, without blind sac; intestine short; one pyloric appendage. Pseudobranchiæ none; air-bladder simple *. Gill-openings wide. The ova fall into the abdominal cavity before exclusion.

Fresh waters of North America.

Only one genus is known.

1. HYODON.

Hiodon, *Lesueur, Journ. Ac. Nat. Sc. Philad.* i. p. 364.
Glossodon, *Heckel, in Russegger's Reisen*, i. p. 1033.

Body oblong, compressed, with a part of the abdomen trenchant; cleft of the mouth of moderate width, oblique, upper jaw overlapping the lower. Bands of small teeth in the jaws, on the palatine and pterygoid bones, along the vomer, sphenoid, and hyoid; tongue with an outer series of larger teeth. Dorsal fin short, opposite to the anterior part of the anal, which is long; caudal forked. Pectoral and ventral fins well developed. Gill-membranes entirely separate, terminating in front below a transverse fold across the middle of the throat. Branchiostegals in moderate number.

Fresh waters of North America.

1. Hyodon tergisus.

The Moon-eye.
Hiodon tergisus, *Lesueur, l. c.* p. 366; *Kirtland, Rep. Zool. Ohio*, pp. 170, 195; and *Bost. Journ. Nat. Hist.* v. 1846, p. 338; *Dekay, New York Faun. Fish.* p. 265, pl. 41. fig. 130; *Cuv. & Val.* xix. p. 309, pl. 572; *Girard, U. S. & Pac. R. R. Exped. Fish.* p. 332, pl. 75. figs. 1–4 (not 4–7).

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* Lesueur describes two additional small subglobular air-vessels at the anterior end of the air-bladder, probably mistaking portions of the somewhat thicker outer membrane of the air-bladder as separate divisions.

Hiodon clodalus, *Lesueur, l. c.* p. 367, pl. 14; *Dekay, l. c.* p. 266, pl. 51. fig. 164.
—— chrysopsis, *Richards. Faun. Bor.-Amer.* iii. p. 232.
Cyprinus (Abramis?) smithii, *Richards. l. c.* p. 110 (fig. faulty).

B. 8–10. D. 14. A. 32–34. L. lat. 57–60. L. transv. 7/9. Vert. 31/30.

The length of the head is two-ninths of the total (without caudal). Snout obtusely rounded, shorter than the eye; maxillary not extending to below the centre of the orbit. Suboperculum rather longer than deep. There are seven longitudinal series of scales between the lateral line and ventral fin. Origin of the dorsal fin slightly in advance of that of the anal. Uniform silvery.

Fresh waters of North America.

a. Fine specimen. Lake Erie. Purchased of Mr. Wright.
b–c, d–f. Fine specimens. Montreal. Purchased of Mr. Wright.
g–h. Fine specimens. North America. Presented by Max, Prince of Neuwied.
i. Adult: skeleton. Montreal. Purchased of Mr. Wright.

Fam. 20. OSTEOGLOSSIDÆ.

Body covered with large hard scales, composed of pieces like mosaic; head scaleless, its integuments nearly entirely replaced by bone; lateral line composed of wide openings of the mucus-duct. Margin of the upper jaw formed by the intermaxillaries mesially, and by the maxillaries laterally. The dorsal fin belongs to the caudal portion of the vertebral column, is opposite and very similar to the anal fin; both approximate to the rounded caudal (with which they are abnormally confluent). Gill-openings wide; pseudobranchiæ none; air-bladder simple or cellular. Stomach without cæcal sac; pyloric appendages two.

Large freshwater fishes of the tropics.

Synopsis of the Genera.

Barbels two; abdomen trenchant .... 1. Osteoglossum, p. 377.

Barbels none; abdomen rounded; teeth anteriorly on the palate.
2. Arapaima, p. 379.

Barbels none; abdomen rounded; palate smooth anteriorly.
3. Heterotis, p. 379.

1. OSTEOGLOSSUM.

Osteoglossum, *Vandelli*; *Agassiz.*
Ischnosoma, *Spix, Pisc. Bras.* p. 46 (*see* Heterotis niloticus, p. 380).
Scleropages, *Günth. Ann. & Mag. Nat. Hist.* 1864, xiv. p. 196.
Anatomy: see *Hyrtl, Denkschr. Ak. Wiss. Wien,* viii. 1855, *in Memoir on* Heterotis.

Body more or less elongate, compressed, with the abdomen compressed into a trenchant edge; cleft of the mouth very wide, oblique, with the lower jaw prominent. A pair of barbels at the lower jaw. Maxillary very long, styliform, scarcely protractile. Jaws with a series of small teeth; bands of rasp-like teeth on the vomer, palatine and pterygoid bones, on the tongue and hyoid. Pectoral fins elongate. Gill-membranes nearly entirely separate; branchiostegals rather numerous; air-bladder simple. Stomach without blind sac; two pyloric appendages.

Fresh waters of tropical America, Australia, and of the East-Indian archipelago.

1. Osteoglossum bicirrhosum.

Osteoglossum bicirrhosum, *Vandelli*; *Agass. in Spix, Pisc. Bras.* p. 47.
Ischnosoma bicirrhosum, *Spix*, *l. c.* tab. 25 (anal and caudal fins abnormally united) and (anat.) tab. A.
Osteoglossum vandellii, *Cuv. Règne Anim.*; *Cuv. & Val.* xix. p. 294, pl. 571.
—— arowana, *Schomburgk, Fish. Guiana,* p. 205, pl. 12 (very bad).

B. 10. D. 43–46. A. 50–51. L. lat. 32. L. transv. 3½/2. Vert. 31/30 (*Hyrtl*).

The length of the head is one-fifth of the total (without caudal). Distance between the pectoral and ventral fins less than the length of the head. Scarcely any free space between anal and caudal fins. Barbels varying in length.

Brazil; Guyanas.

a. Twenty-five inches long. Pará. Presented by J. P. G. Smith, Esq.
b. Twelve inches long. British Guyana. Presented by Sir R. Schomburgk.

2. Osteoglossum formosum.

Müll. & Schleg. Verh. Nat. Gesch. Ned. overz. Bez. Zool. Vissch. pl. 1; *Bleek. Nat. Tyd. Ned. Ind.* ii. p. 436.

B. 15. D. 18–20. A. 27. V. 5. L. lat. 24. L. transv. 2½/2.

The length of the head is two-sevenths of the total (without caudal), and equal to the distance between the pectoral and ventral fins. A distinct space between the anal and caudal. Barbels varying in length.

Borneo, Banka, and Sumatra.

a. Skin in spirits. Borneo. From the Leyden Museum.

3. Osteoglossum leichardti.

Scleropages leichardti, *Günth. l. c.* p. 196, pl. 7.

D. 20. A. 31. V. 5. L. lat. 35. L. transv. 3/4.

The length of the head is contained thrice and three-fourths in the total (without caudal), and rather more than the distance between the pectoral and ventral fins. A distinct space between anal and caudal. Barbels very small.

Queensland.

a. Type of the species, stuffed, 28 inches long. From Leichardt's Collection.

2. ARAPAIMA [*].

Sudis, sp., *Cuv. Règne Anim.* (not *Rafin.*).
Arapaima, *Müller, Abhandl. Ak. Wiss. Berl.* 1846, p. 191.
Vastres, *Cuv. & Val.* xix. p. 433.

Body rather elongate, compressed; head depressed; abdomen rounded. Cleft of the mouth wide, with the lower jaw prominent; barbels none. Jaws with an outer series of conical small teeth; broad bands of rasp-like teeth on the vomer, palatines, pterygoids, sphenoid, os linguale, and hyoideum. Pectoral fins of moderate length; vertical fins scaly. Gill-membranes separate; branchiostegals rather numerous. Air-bladder — (?). No accessory branchial organ.

Brazils and Guyanas.

1. Arapaima gigas.

Sudis gigas, *Cuv. Règne Anim.*; *Agass. in Spix, Pisc. Bras.* p. 31, (anat.) tab. B (skeleton; *Schomburgk, Fish. Guian.* p. 198, tab. 11) (not good).
—— pirarucu, *Spix, l. c.* pl. 16 (bad).
Vastres cuvieri, *Cuv. & Val.* xix. p. 441, pls. 579 & 580 (head).
—— mapæ, *Cuv. & Val.* xix. p. 449, pls. 580 & 581 (head).
—— agassizii, *Cuv. & Val.* xix. p. 456.
—— arapaima, *Cuv. & Val.* xix. p. 461.

B. 16. D. 34–37. A. 30–32. V. 6. L. lat. 56. L. transv. 6½/6 (between dorsal and anal). Vert. 38/41.

Maxillary reaching to below the orbit. The length of the head is rather less than one-fourth of the total (without caudal).

Brazils and Guyanas.

a. Eight feet long; stuffed. British Guyana. Presented by Sir R. Schomburgk.
b. Seven feet long: stuffed. Bahia. Purchased of Mr. Stevens.
c. Skeleton, six feet long. British Guyana. Presented by Sir R. Schomburgk.
d. Parts of the skeleton of a young example.
e. Hyoid bone of a large example.

3. HETEROTIS.

Sudis, sp., *Cuv. Règne Anim.*
Heterotis, *Ehrenberg.*

Body rather elongate, compressed; head compressed; abdomen rounded. Cleft of the mouth rather small, with the jaws subequal; barbels none. A single series of small teeth in the jaws; pterygoids and hyoid with a patch of small conical teeth; none on the vomer or palatine bones. Gill-membranes separate, with eight branchiostegals; the fourth branchial arch with a spiral accessory organ (branchial helix, *Hyrtl*). Air-bladder cellular. Stomach divided into a membranaceous and muscular portion; two long pyloric appendages; intestinal tract with an upper and lower bend.

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[*] The names of *Vastres jussiei* and *Vastres condaminei* have been given by Valenciennes to hyoid bones of *Arapaima* or *Osteoglossum*, Cuv. & Val. xix. p. 462

Tropical Africa.

1. Heterotis niloticus.

Sudis adansonii, *Cuv. Règne Anim.*
—— niloticus, (*Ehrenb.*) *Cuv. Règne Anim.*; *Rüpp. Beschreib. Neu. Nil-Fische*, 1829, p. 10, taf. 3. fig. 2.
Heterotis niloticus, *Ehrenberg.*
—— ehrenbergii, *Cuv. & Val.* xix. p. 469, pls. 583 & 584.
—— adansoni, *Cuv. & Val.* xix. p. 478.
Anatomy: *Hyrtl, Denkschr. Ak. Wiss. Wien*, viii. 1855, pp. 16, with 3 plates.

B. 8. D. 33–34. A. 35–36. V. 6. L. lat. 35–36. L. transv. $4\frac{1}{2}/5$. Vert. $\frac{25\text{–}27}{42}$.

The length of the head is a little more than one-fourth of the total (without caudal). Anal fin commencing somewhat in advance of the dorsal.

Nile; West Africa.

a. Twenty-two inches long. Nile.
b–d. Half-grown. White Nile (lat. 9° N.). From Mr. Petherick's Collection.—One of these specimens has the vertical fins united, illustrating that *Ischnosoma* of Spix and Valenciennes was founded on a similarly deformed example.
e. Half-grown. West Africa. Purchased of Mr. Dalton.
f–h. Skins: from 16 to 35 inches long. West Africa. Purchased of Mr. Dalton.
i. Adult: skeleton. Chartoum. From Mr. Petherick's Collection.

Fam. 21. CLUPEIDÆ.

Clupeidæ part., *Cuv. Règne Anim.*; *Müller, Abhandl. Ak. Wiss. Berl.* 1846, p. 192.
Clupeoidei, *Müller, Arch. Naturgesch.* 1843, p. 324.

Body covered with scales; head naked; barbels none. Abdomen frequently compressed into a serrated edge. Margin of the upper jaw formed by the intermaxillaries mesially, and by the maxillaries laterally; maxillaries composed of three, sometimes moveable pieces. Opercular apparatus complete. Adipose fin none. Dorsal not elongate; anal sometimes very long. Stomach with a blind sac; pyloric appendages numerous. Gill-apparatus much developed, the gill-openings being generally very wide. Pseudobranchiæ large, except in *Megalops*. Airbladder more or less simple.

Inhabitants of all seas, many species entering fresh waters.

Synopsis of the Groups and Genera.

I. Mouth very wide, lateral; intermaxillary very small, firmly united to the maxillary, which is elongate and scarcely protractile; upper jaw projecting: Engraulina.

No pectoral filaments; gill-membranes broadly united. 1. Cetengraulis, p. 383.

No pectoral filaments; union of the gill-membranes very short. 2. Engraulis, p. 384.

Filaments above the pectorals .... 3. Coilia, p. 402.

II. Mouth transverse, inferior or subinferior, narrow, without teeth; upper jaw overlapping the lower; abdomen serrated: Chatoessina.

Branchial arches with a double bend .... 4. Chatoëssus, p. 406.

III. Upper jaw not overlapping the lower; abdomen serrated: Clupeina.

A. Anal fin with less than 30 rays; dorsal opposite to ventrals.

Teeth none, or quite rudimentary; abdominal serrature commencing from the thorax or pectorals.. 5. Clupea, p. 412.

Teeth none, or quite rudimentary; abdominal serrature commencing behind the pectorals .... 6. Clupeoides, p. 451.

Dentition well developed; teeth of moderate size 7. Pellonula, p. 452.

Canine-like teeth in the jaws .... 8. Clupeichthys, p. 453.

B. Anal fin with more than 30 rays; dorsal behind the ventrals or opposite to anal.

Ventral fins present; teeth villiform................. 9. Pellona, p. 454.

Ventral fins none; teeth villiform..................... 10. Pristigaster, p. 460.

Ventral fins present; jaws with canine teeth ...... 11. Chirocentrodon, p. 463.

IV. Mouth anterior and lateral; upper jaw not overlapping the lower; abdomen neither keeled nor serrated; no osseous gular plate: Dussumieriina.

Dorsal opposite to ventrals; teeth none or deciduous. 12. Spratelloides, p. 464.

Dorsal opposite to ventrals; teeth small but non-deciduous. 13. Dussumieria, p. 466.

Dorsal entirely in advance of ventrals .... 14. Etrumeus, p. 467.

V. Mouth inferior, of moderate width, toothed: upper jaw projecting beyond the lower; intermaxillary juxtaposed to the upper anterior edge of maxillary: Albulina.

Broad patches of coarse granular teeth on the roof and bottom of the mouth. 15. Albula. p. 468.

VI. Upper jaw shorter than lower; abdomen rounded; an osseous gular plate: Elopina.

Scales small; pseudobranchiæ well developed...... 16. Elops, p. 469.

Scales large; pseudobranchiæ none or rudimentary 17. Megalops, p. 471.

VII. Mouth small, anterior, transverse, toothless; intermaxillary juxtaposed to the upper anterior edge of maxillary; abdomen flat; gill-membranes entirely united: Chanina.

Scales small, striated .... 18. Chanos, p. 473.

First Group. ENGRAULINA.

Mouth very wide, lateral; intermaxillary very small, firmly united to the maxillary, which is elongate and scarcely protractile; upper jaw projecting.

1. CETENGRAULIS*

Engraulis, sp., *Cuvier*.

Body oblong, compressed, with the abdomen not serrated. Scales of moderate size. Snout conic, projecting beyond the lower jaw. Teeth none (or quite rudimental). Maxillary very little moveable. Anal fin long; dorsal fin opposite to the space between ventrals and anal. Gill-membranes united, exceedingly broad, nearly covering the isthmus entirely; branchiostegals long, filiform, seven or eight in number.

Central America; West Indies.

1. Cetengraulis edentulus.

Sprat, *Sloane, Jam.* ii. p. 282, tab. 250. fig. 2.
Engraulis edentulus, *Cuv. Règne Anim.*; *Cuv. & Val.* xxi. p. 51.

B. 7. D. 15. A. 23(–26). L. lat. 42. L. transv. 11.

The height of the body is equal to the length of the head, and one-third of the total (without caudal). Teeth none; the maxillary extends nearly to the mandibulary joint. The diameter of the eye is two-ninths of the length of the head. Origin of the dorsal fin nearer to the root of the caudal than to the end of the snout; commencement of the anal fin nearly opposite to the end of the dorsal; caudal fin not scaly. Pectoral extending to the ventral. Coloration uniform.

Atlantic coasts of Tropical America.

a. Several skins, 5 or 6 inches long. Jamaica. Purchased of Mr. Parnell.

2. Cetengraulis mysticetus.

Engraulis mysticetus, *Günth. Proc. Zool. Soc.* 1866, p. 604.

B. 8. D. 15–17. A. 20–22. L. lat. 42. L. transv. 14.

The height of the body is contained thrice and one-half or thrice and two-thirds in the total length (without caudal), the length of the head twice and four-fifths or twice and two-thirds. Teeth none; the maxillary does not extend backwards to the mandibulary joint. The diameter of the eye is contained five times and one-half in the length of the head. Gill-rakers very long, setiform, closely set, about 42 on the lower branch of the outer branchial arch. Origin of the dorsal fin midway between the root of the caudal and the eye; origin of the anal fin nearly opposite to the end of the dorsal; caudal fin not scaly. Pectoral extending to or a little beyond ventral. Coloration uniform.

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* 1. Engraulis brevis, *Poey, Repert. Fis.-Nat. Cub.* 1866, p. 379, from Cuba. It is a matter of doubt whether this species really belongs to *Cetengraulis*. The author compares it with *E. edentulus*; but he compares it also to *E. productus*, which is a true *Engraulis*. He says that *E. brevis* has minute teeth on the posterior half of the maxillary. The numbers of fin-rays are evidently erroneous. He appears to have misunderstood a part of Valenciennes's description of *E. edentulus, who describes the two large scales on the caudal*, but does not say that this fin is scaly; *also the height of the body is*, according to Valenciennes, *more than one-fourth of the total length*, and not, as Poey supposes, contained more than four times in it.

Pacific coast of Panama.

a, b–c. Types of the species. From the Collection of Messrs. Dow & Salvin.

2. ENGRAULIS.

Clupea, sp., *et* Stolephorus, *Lacep.*
Engraulis *et* Thrissa, *Cuvier.*
Engraulis, *Cuv. & Val.*

Body oblong, compressed. Scales large or of moderate size. Snout more or less conical, projecting beyond the lower jaw (except in *E. breviceps*). Generally small teeth in the jaws, on the vomer, palatine, and pterygoid bones. Intermaxillaries very small, hidden; maxillary long, attached to the cheek by a scarcely distensible membrane. Anal fin of moderate or great length. Union of the gill-membranes very short, leaving the isthmus uncovered, the gill-openings being extremely wide. Branchiostegals short, from nine to fourteen in number.

Temperate and tropical seas; many species entering fresh waters.

I divide this genus into several subgenera, and arrange the species thus:—

I. None of the pectoral rays prolonged; anal rays 50 or less.

A. The teeth are of equally small size if present.

1. Origin of the dorsal fin in advance of that of the anal.

a. The maxillary does not extend beyond the gill-opening: *Engraulis* (Cuv.).

aa. No teeth in the jaws, p. 385.

bb. Teeth in the maxillary, none in the lower jaw.

* No silvery band along the side, p. 385.

** A well-defined silvery band along the side, p. 388.

cc. Teeth in both jaws, p. 392.

b. The maxillary extends backwards beyond the gill-opening: *Thrissa* (Cuv.), p. 395.

2. Origin of the anal fin in advance of that of the dorsal: *Pterengraulis*, p. 398.

B. Teeth in the jaws unequal in size, some being enlarged.

1. Origin of the dorsal fin in advance of that of the anal: *Lycengraulis*, p. 399.

2. Origin of the anal fin in advance of that of the dorsal: *Lycothrissa*, p. 399.

II. The upper pectoral ray is prolonged into a filament; anal rays 50 or more.

A Upper jaw prominent: *Telara*, p. 400.

B. Lower jaw prominent: *Heterothrissa*, p. 401.

I. *None of the pectoral rays prolonged; anal rays* 50 *or less.*

A. *The teeth are of equally small size, if present.*

1. *Origin of the dorsal fin in advance of that of the anal.*

a. *The maxillary does not extend beyond the gill-opening*: Engraulis.

aa. *No teeth in the jaws.*

1. Engraulis macrolepidotus.

Kner & Steindachner, Abhandl. Bayer. Akad. Wiss. x. 1864 (1865), tab. 3. fig. 2.

B. 12–13. D. 12. A. 28 (29). L. lat. 35. L. transv. 9.

The height of the body is one-third of the total length (without caudal), the length of the head two-sevenths; head one-fourth longer than deep. Snout very short, not far projecting beyond the lower jaw. Maxillary edentulous, narrow, and rounded behind, extending to the angle of the præoperculum. Origin of the dorsal fin somewhat nearer to the root of the caudal than to the end of the snout. The anal commences immediately behind the last dorsal ray. Abdomen slightly compressed. Scales adherent. An indistinct bluish band along the side. (*K. & St.*)

Rio Bayano (Panama).

bb. *Teeth in the maxillary, none in the lower jaw.*

* *No silvery band along the side.*

2. Engraulis encrasicholus.

Anchovy. Anchois.
Ἔγκραυλος, *Aristot.* vi. c. 15; *Athen.* iv. 148, & vii. 285, 300.
Ἐγκρασίχολοι, *Ælian.* viii. c. 18. p. 497.
Λυκόστομος, *Ælian.* viii. c. 18. p. 497.
Halecula, *Bellon.* pp. 168, 169.
Encrasicholus, *Rondel.* vii. c. 2. p. 211; *Aldrov.* ii. c. 33. p. 214; *Willughb.* p. 225, tab. P. 2 fig. 2.
Lycostomus balticus, *Schonev.* v. c. 2. p. 46.
Clupea, sp. no. 3, *Artedi, Synon.* p. 17; no. 4, *Genera*, p. 7.
Clupea encrasicholus, *L. Syst. Nat.* i. p. 523; *Fabr. Faun. Grönl.* p. 183; *Bl. Fische Deutschl.* ii. p. 212, tab. 30. f. 2; *Bl. Schn.* p. 423; *Lacép.* v. p. 455; *Brünnich, Pisc. Mass.* p. 83; *Donov. Brit. Fish.* iii. pl. 50; *Pallas, Zoogr. Ross.-As.* iii. p. 212; *Risso, Ichthyol. Nice*, p 354.

Argentina, sp., *Gronov. Zoophyl.* no. 349.
Duhamel, Pêches, ii. § 3, pl. 17. fig. 5.
Roqueron or Anchoa, *Cornide, Peces Galic.* p. 99.
Bykling or Moderlöse, *Müll. Prodr. Faun. Dan.* p. 50.
Anchovy, *Penn. Brit. Zool.* iii. p. 304, pl. 67, or, ed. 1812, iii. p. 441, pl. 78; *Yarrell*, 2nd edit. ii. p. 217, or 3rd edit. i. p. 515; *Couch, Hist. Brit. Fish.* iv. p. 125, pl. 206.
Engraulis encrasicholus, *Cuv. Règne Anim.*; *Risso, Eur. Mérid.* iii. p. 454; *Jenyns, Man.* p. 439; *Cuv. & Val.* xxi. p. 7, pl. 607; *Nilss. Skand. Faun. Fisk.* p. 531; *Kröyer, Danm. Fisk.* iii. p. 221.
Engraulis meletta, *Cuv. Règne Anim.*
Encrasicholus encrasicholus, *Fleming, Brit. An.* p. 183.
Engraulis vulgaris, *Nilss. Prodr.* p. 25.
—— desmaresti, *Risso, Eur. Mérid.* iii. p. 455.
? Engraulis amara, *Risso, l. c.* p. 456.
Argentina sphyræna, *Gronov. Syst.* ed. *Gray*, p. 141.

B. 12–13. D. 16–17. A. 16–17 (18–20, south. hemisphere). L. lat. 48–50. Vert. 46–47.

The height of the body is one-seventh of the total length (without caudal), the length of the head one-fourth; head nearly twice as long as deep. Snout pointed, much projecting beyond the lower jaw; maxillary very finely toothed, obtusely rounded behind, not extending to the mandibulary joint. Origin of the dorsal fin midway between the end of the snout and the root of the caudal fin. Anal commencing at some distance behind the dorsal. Abdomen rounded. Sides and abdomen silvery, separated from the dark coloration of the back by a blackish stripe.

Coasts of Europe; South Pacific.

a–d. Adult. Nice. From Dr. Deakin's Collection.
e. Fine specimen. Adriatic. Presented by L. Conyngham, Esq.

Var. *antipodum*.

The only difference between European specimens and those from the southern hemisphere is a slightly increased number of anal rays, viz. 18–20.

a. Adult. Van Diemen's Land. Presented by Dr. Robertson.
b–c. Adult and half-grown. New Zealand. From the Haslar Collection.

3. Engraulis ringens.

Engraulis ringens, *Jenyns, Voy. Beagle, Fish.* p. 136; *Cuv. & Val.* xxi. p. 27.
—— mordax, *Girard, Proc. Ac. Nat. Sc. Philad.* 1854, pp. 138, 154; and *U. S. Pac. R. R. Exped. Fish.* p. 334.
—— pulchellus, *Girard, Proc. Ac. Nat. Sc. Philad.* 1854, p. 199; or *U. S. Nav. Astron. Exped. Zool. Fish.* p. 247, pl. 31. figs. 5–9 (not good).
—— nasus, *Kner & Steindachner, Sitzgsber. Ak. Wiss. Wien*, 1866, liv. Octbr. fig. 17.

B. 14. D. 14–15. A. 19–22. L. lat. 41.

The height of the body is one-fifth of the total length (without caudal), the length of the head a little less than one-third; head nearly twice as long as deep. Snout pointed, much projecting beyond the lower jaw; maxillary very finely toothed, somewhat pointed behind, extending to, or nearly to, the mandibulary joint. Origin of the dorsal fin somewhat nearer to the root of the caudal fin than to the end of the snout. Anal commencing at a short distance behind the dorsal. Abdomen scarcely compressed. Scales thin, deciduous, with the margin irregularly rounded. Sides and lower parts silvery, back dark-coloured.

Pacific coast of America.

a. One of the typical examples. Peru. Presented by Ch. Darwin, Esq.
b–c. Half-grown. Valparaiso.
d. Adult. California. Purchased of Mr. Gruber.

I agree with Valenciennes, who draws attention to the close resemblance of *Engraulis japonicus*, Schleg. Faun. Japon. Poiss. p. 239, pl. 108. fig. 3 (Cuv. & Val. xxi. p. 28; Bleek. Verh. Bat. Gen. xxvi. Japan, p. 119; not Houttuyn), to this species, and considers it very possible that both are identical. The occurrence of one and the same species of Clupeoid in California, Chile, and Japan is not a very extraordinary fact; and if the Japanese fish really prove identical with that from the Eastern Pacific, the species will probably be found also in Australia.

Engraulis nanus, Girard, U. S. Pac. R. R. Exped. Fish. p. 335, from San Francisco, may also be the same species.

4. Engraulis zollingeri.

Engraulis zollingeri, *Bleek. Journ. Ind. Archip.* iii. p. 73; *Verh. Bat. Gen.* xxiv. *Haring*, p. 38; *Nat. Tydschr. Ned. Ind.* xvi. p. 172.
Stolephorus zollingeri, *Bleek. Ned. Tydschr. Dierk.* iii. p. 303.

B. 12–13. D. 15. A. 16. L. lat. 38.

The height of the body is two-elevenths of the total length (without caudal), the length of the head two-sevenths; head not quite twice as long as deep. Snout pointed, much projecting beyond the lower jaw; maxillary very finely toothed, truncated behind, extending to the mandibulary joint. Origin of the dorsal fin midway between the root of the caudal fin and the end of the snout. Anal commencing at some distance behind the dorsal. Abdomen scarcely compressed. Scales thin, deciduous. Sides and lower parts silvery, back dark-coloured.

Bali; Sumbawa; Celebes.

a. Three and a half inches long. From Dr. Bleeker's Collection.

5. Engraulis encrasicholoides.

Engraulis encrasicholoides, *Bleek. Verh. Bat. Gen.* xxiv. *Haring*, p. 37; or *Nat. Tydschr. Ned. Ind.* iii. p. 163; *Kner, Novara, Fisch.* p. 333.

B. 13. D. 15. A. 26–28. L. lat. 38.

The height of the body is contained four times and one-fifth in the total length (without caudal), the length of the head four times; head one-third longer than deep. Snout slightly pointed, not far projecting beyond the lower jaw; maxillary very finely toothed, truncated behind, extending to the mandibulary joint. Origin of the dorsal fin somewhat nearer to the end of the snout than to the root of the caudal fin. Anal commencing at a short distance behind the dorsal. Abdomen scarcely compressed, some of the scales along the median line of the abdomen terminating in a spine. Scales thin, not readily deciduous, with numerous vertical striæ. Sides and lower parts silvery, back dark-coloured.

East-Indian archipelago; Siam.

a. One of the typical specimens. From Dr. Bleeker's Collection.

6. **Engraulis productus.**

Poey, Repert. Fis.-Nat. Cub. 1866, p. 380.

B. 12 or 13. D. 13. A. 29–33. L. lat. 40.

The height of the body is rather more than the length of the head, and two-sevenths of the total length (without caudal). Snout pointed, much projecting beyond the lower jaw. Teeth present in the upper jaw only, and so minute as to be only visible with a lens. Maxillary sword-shaped, obliquely truncated, and tapering behind, extending nearly to the gill-opening. Origin of the dorsal fin nearly midway between the root of the caudal fin and the end of the snout. Anal fin commencing below the middle of the dorsal. Abdomen compressed, without scutes. Coloration uniform.

Cuba; Jamaica.

a. Several skins (180 mm. long). Jamaica. From Dr. Parnell's Collection.

** *A well-defined silvery band along the side.*

7. **Engraulis commersonianus.**

Stolephorus commersonianus, *Lacép.* v. p. 382, pl. 12. fig. 1 (bad).
Clupea vittargentea, *Lacép.* v. p. 458.
Atherina commersoniana, *Shaw, Zool.* v. 1. pl. 113. fig. 1. (cop. from *Lacépède*).
? Atherina australis, *White, Voy. N. S. Wales*, p. 296, c. fig.
Engraulis brownii, *Cuv. & Val.* xxi. p. 41 (descript. and synon. pars); *Bleek. Verh. Bat. Gen.* xxiv. *Haring*, p. 39.

B. 12. D. 15. A. 21. L. lat. 40.

The height of the body is contained four times and one-half in the total length (without caudal), the length of the head four times and one-third; head one-third longer than deep. Snout pointed, much projecting beyond the lower jaw; maxillary very finely toothed, produced, and pointed behind, extending to the angle of the præoperculum. Origin of the dorsal fin nearer to the root of the caudal fin than to the end of the snout. Anal commencing below the posterior third of the dorsal. Abdomen slightly compressed in front of the ventrals. Scales thin, deciduous. A well-defined silvery band, rather narrower than the orbit, along the side.

East-Indian ocean and archipelago; ? Australia.

a. Adult. Zanzibar. From Colonel Playfair's Collection.
b. Adult. From the Collection of the Zoological Society.
c–e. Half-grown. Bengal. Presented by G. R. Waterhouse, Esq.

8. **Engraulis tri.**

Engraulis tri, *Bleek. Verh. Bat. Gen.* xxiv. *Haring*, p. 40; or *Nat. Tydschr. Ned. Ind.* iii. p. 436.

B. 11–12. D. 14. A. 20. L. lat. 39*.

The height of the body is nearly equal to the length of the head, and one-fourth of the total length (without caudal); head one-third longer than deep. Snout pointed, much projecting beyond the lower jaw; maxillary very finely toothed, produced and pointed behind, extending to the gill-opening. Origin of the dorsal fin nearer to the root of the caudal fin than to the end of the snout. Anal commencing below the posterior fourth of the dorsal. Abdomen slightly compressed in front of the ventrals, with four scutes terminating in long slender spines. Scales thin and deciduous. A well-defined silvery band, as broad as the orbit, along the side.

Java; Banka; Borneo.

a. One of the typical specimens. From Dr. Bleeker's Collection.

9. **Engraulis brownii.**

? Piquitinga, *Marcgr. Pisc. Bras.* p. 159.
Menidia, *Brown, Jam.* p. 441, tab. 45. fig. 3.
Argentina, sp., *Gronov. Zoophyl.* p. 112. no. 350.
Atherina brownii, *L. Gm.* i. p. 1397.
Engraulis piquitinga, *Spix, Pisc. Bras.* tab. 23. fig. 1 (not good).
—— tricolor, *Agass. ibid.* p. 51.
Argentina menidia, *Gronov. Syst.* ed. *Gray*, p. 141.

B. 12. D. 15. A. 19–21. L. lat. ca 42.

The height of the body is contained four times and two-thirds in the total length (without caudal), the length of the head thrice and three-fourths; head two-thirds as long as deep. Snout pointed, much projecting beyond the lower jaw; maxillary very finely toothed, produced and pointed behind, extending to the margin of the suboperculum. Origin of the dorsal fin nearer to the root of the caudal fin than to the end of the snout. Anal commencing below the posterior fourth of the dorsal. Abdomen slightly compressed in front of the ventrals. Scales thin, deciduous. A well-defined, intensely silvery band along the side.

Tropical parts of the Atlantic; Pacific coast of Central America; Ceylon.

a. Fine specimen. San Domingo. Purchased of Mr. Cuming.
b–d. Adult. Jamaica. From Mr. Parnell's Collection.
e–h. Half-grown. Jamaica. From Mr. Gosse's Collection.
i–k. Half-grown: skins. Jamaica. From Mr. Parnell's Collection.

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* Not 30 as stated by Bleeker.

l. Half-grown. West Indies. From the Collection of the Zoological Society.
m. Half-grown. Gulf of Mexico. From Mr. Frank's Collection.
n. Adult. Bahia. From Dr. Wucherer's Collection.
o. Several young examples. Libertad. From Mr. Salvin's Collection.
p. Young. Island of Cardon. Presented by J. U. Skinner, Esq.
q–r. Adult. Ceylon. From the Collection of Messrs. von Schlagintweit.
s. Adult. Haslar Collection.
t–u. Adult. Old Collection.

10. **Engraulis japonica.**

Atherina japonica, *Houttuyn, Verh. Holl. Maatsch. Wet. Haarl.* xx. 2, 1781, p. 340.
Engraulis commersonianus, *Richards. Ichth. Chin.* p. 308 (not *Lacép.*).

B. 13. D. 17. A. 22. L. lat. 42.

The height of the body is one-fifth of the total length (without caudal), the length of the head two-ninths; head two-thirds as long as deep. Snout pointed, much projecting beyond the lower jaw; maxillary very finely toothed, produced and pointed behind, extending to the angle of the præoperculum. Origin of the dorsal fin nearer to the root of the caudal fin than to the end of the snout. Anal commencing below the middle of the dorsal. Abdomen compressed in front of the ventrals, with six scutes. A well-defined silvery band, narrower than the orbit, runs along the side.

Japan; China.

a, b, c–f. Adult and half-grown. China.
g–i. Adult. Amoy. Purchased of Mr. Stevens.

11. **Engraulis russellii.**

Nattoo, *Russell,* ii. pl. 187.
Engraulis brownii, *Cant. Mal. Fish.* p. 303 (not *Gm.*).
—— balinensis, *Bleek. Verh. Bat. Gen.* xxii. *Bali,* p. 11.
—— russellii, *Bleek. l. c.* xxiv. *Haring,* p. 38.

B. 13. D. 16. A. 19-21. L. lat. 40.

The height of the body is contained five times and one-half in the total length (without caudal); the length of the head from four times and one-fifth to four times and one-half; head two-thirds longer than deep. Snout pointed, much projecting beyond the lower jaw; maxillary extremely finely toothed, rounded behind, extending to the mandibulary joint. Origin of the dorsal fin nearer to the root of the caudal fin than to the end of the snout. Anal commencing below the middle of the dorsal. Abdomen slightly compressed in front of the ventrals, with a series of four long, slender spines. Scales thin, deciduous. A well-defined silvery band along the side.

East Indies.

a. Adult. Amboyna. Purchased of Mr. Frank.
b. Adult. From Dr. Bleeker's Collection.
c–d. Adult and young: skins. Malayan peninsula. From Dr. Cantor's Collection.

12. Engraulis perfasciatus.

? Engraulis argyrophanus, *Cuv. & Val.* xxi. p. 49.
Engraulis perfasciatus, *Poey, Mem. Cub.* ii. p. 312.

D. 14. A. 15–17.

The height of the body is one-sixth of the total length (without caudal), the length of the head one-fourth; head two-fifths longer than deep. Snout pointed, much projecting beyond the lower jaw, maxillary extremely finely toothed, obtusely rounded behind, extending to the mandibulary joint. Origin of the dorsal fin nearer to the root of the caudal fin than to the end of the snout. Anal commencing immediately behind the dorsal. Abdomen scarcely compressed in front of the ventrals. Scales thin, deciduous. A well-defined silvery band along the side.

San Domingo; Cuba.

a–b. Adult and half-grown. San Domingo. Presented by Dr. A. Günther.
c–e. Adult. San Domingo. Purchased of M. Parzudaki.

13. Engraulis mitchilli.

? Clupea vittata, *Mitchill, Trans. Lit. & Phil. Soc. New York*, i. p. 456; *Dekay, New York Faun. Fish.* p. 254.
? Clupea cærulea, *Mitchill, l. c.* p. 457; *Dekay, l. c.*
Engraulis mitchilli, *Cuv. & Val.* xxi. p. 50.

D. 15. A. 23. L. lat. 40.

The height of the body is a little more than the length of the head, which is one-fourth of the total length (without caudal); head one-third longer than deep. Snout pointed, much projecting beyond the lower jaw; maxillary very finely toothed, obliquely truncated behind, extending to the mandibulary joint. Origin of the dorsal fin scarcely nearer to the root of the caudal fin than to the end of the snout. Anal commencing below the posterior third of the dorsal. Abdomen slightly compressed in front of the ventrals. Scales thin, deciduous. A well-defined silvery band along the side.

Atlantic coasts of America.

a–b. Adult. Cayenne.

14. Engraulis delicatissimus.

Girard, Proc. Ac. Nat. Sc. Philad. 1854, p. 154; and *U. S. Pac. R. R. Exped. Fish.* p. 335.

D. 15. A. 25.

The height of the body is somewhat less than the length of the head, which is contained five times and one-half in the total (with the caudal). Extremity of the maxillary extending to the gill-opening. Origin of the dorsal fin nearer to the root of the caudal than to the end of the snout. A silvery band runs along the side. (*Girard.*)

California.

15. **Engraulis heterolobus.**

Rüppell, N. W. Fische, p. 79, taf. 21. fig. 4; *Bleek. Ned. Tydschr. Dierk.* iii. p. 305.

B. 12. D. 14. A. 17–18. L. lat. 42.

The height of the body is two-elevenths of the total length (without caudal), the length of the head one-fourth; head not quite twice as long as deep. Snout pointed, much projecting beyond the lower jaw; maxillary very finely toothed, rather pointed behind, extending somewhat beyond the mandibulary joint. Origin of the dorsal fin midway between the end of the snout and the root of the caudal fin. Anal commencing immediately behind the dorsal. Abdomen compressed in front of the ventrals, with several scutes. A well-defined silvery band along the side.

Red Sea; East-Indian archipelago; Surinam.

a. One of the typical specimens. Red Sea. Purchased of Dr. Rüppell.

b. East-Indian archipelago. From Dr. Bleeker's Collection.

16. **Engraulis brevirostris.**

B. 14. D. 15. A. 18. L. lat. 41.

The height of the body is contained five times and one-third in the total length (without caudal), the length of the head four times and a half; head two-fifths longer than deep. The diameter of the eye is two-sevenths of the length of the head, and much longer than the snout, which projects but slightly beyond the lower jaw. Maxillary with the dentition exceedingly fine; it is dilated and rounded behind, and does not extend backwards to the mandibulary joint. Origin of the dorsal fin midway between the end of the snout and the root of the caudal; anal fin commencing below the posterior dorsal rays. Pectoral terminating at a great distance from the ventrals. Abdomen slightly compressed. A well-defined silvery band runs along the side; it is narrow in its anterior third, and no part is wider than the orbit. Scales deciduous.

Province of Bahia.

a–b. Three and a half inches long. Caxoeira.

cc. *Teeth in both jaws*

17. **Engraulis poeyi.**

Kner & Steindachner, Abhandl. Bayer. Ak. Wiss. x. i. 1864 (1865), taf. 3. fig. 3.

D. 16. A. 23 (24). L. lat. 42.

The height of the body equals the length of the head, and is contained four times and one-third in the total (without caudal); head one-third longer than deep. Snout short, not far projecting beyond the lower jaw. Both jaws with small teeth. Maxillary extending to the mandibulary joint *. Origin of the dorsal fin nearer to the root of the caudal than to the end of the snout; the anal fin commences below the middle of the dorsal. Scales deciduous. Back brownish; sides and belly silvery. (*K. & St.*)

Rio Dayano.

18. Engraulis surinamensis.

Stolephorus surinamensis, *Bleek. Nederl. Tydschr. Dierk.* iii. 1866, p. 178.

B. 11. D. 13. A. 25–26. L. lat. 38.

The height of the body is nearly equal to the length of the head, and contained thrice and two-thirds in the total (without caudal). Snout much projecting beyond the lower jaw. Maxillary truncated behind, not reaching to the mandibulary joint; minute teeth in both jaws. Gill-rakers very fine, setiform, closely set, longer than the eye. Origin of the dorsal fin midway between the root of the caudal and the end of the snout; it terminates above the anterior anal rays. Abdomen trenchant before and behind the ventrals, without conspicuous spines. An indistinct, broad, silvery band along the side.

Surinam; Brazil.

a. Five inches long. River Capin. Purchased of Mr. Stevens.

19. Engraulis boelama.

Clupea boelama, *Forsk. Descr. An.* p. 72; *Bl. Schn.* p. 429.
Engraulis nesogallicus, *Benn. Proc. Comm. Zool. Soc.* i. p. 168.
—— boelama, *Cuv. & Val.* xxi. p. 35.

B. 11. D. 15. A. 29–32. L. lat. 42.

The height of the body is contained four times in the total length (without caudal), the length of the head thrice and three-fourths. Snout pointed, much projecting beyond the lower jaw. Teeth present in both jaws, minute. Maxillary obliquely truncated behind, slightly extending beyond the mandibulary joint. Gill-rakers fine, about 22 on the lower branch of the outer branchial arch, not longer than the eye. Origin of the dorsal fin nearly midway between the root of the caudal fin and the end of the snout. Anal fin commencing at a very short distance behind the last dorsal rays. Abdomen compressed, the spiny scutes not extending forwards to the base of the pectorals. Coloration uniform.

Red Sea; Indian Ocean.

a. Adult. Zanzibar. From Lieut.-Col. Playfair's Collection.
b–f. Half-grown. Cosseir. Presented by Prof. Peters.

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* According to the figure, the description being evidently incorrect.

20. Engraulis rhinorhynchus.

Engraulis kammalensis, *Bleek. Verh. Bat. Gen.* xxii. *Madura*, p. 13.
—— rhinorhynchus, *Bleek. l. c.* xxiv. *Haring*, p. 41; or *Nat. Tydschr. Ned. Ind.* iv. p. 432.

B. 11. D. 13. A. 32–35.´ L. lat. 38.

The height of the body is contained thrice and one-half in the total length (without caudal), the length of the head thrice and four-fifths. Snout pointed, much projecting beyond the lower jaw. Teeth present in both jaws, minute. Maxillary dilated above the mandibulary joint, tapering behind, extending to the gill-opening. Gill-rakers fine, closely set, rather shorter than the eye. Origin of the dorsal fin nearly midway between the root of the caudal fin and the end of the snout. Anal fin commencing at a very short distance behind the last dorsal rays. Abdomen compressed, the spiny scutes extending forwards to the gill-opening. A blackish spot across the nape, reaching downwards to the scapula.

Java; Borneo.

a. Typical specimen, 95 mm. long. Java. From Dr. Bleeker's Collection.

b. Fine specimen, 95 mm. long. Sarawak. Presented by the Marquis Doria.

21. Engraulis polynemoides.

B. 12. D. 13. A. 35. L. lat. 35.

The height of the body is a little less than the length of the head, which is one-fourth of the total (without caudal); head one-half longer than deep. The diameter of the eye is more than the length of the snout, and two-ninths of that of the head. Snout slightly compressed and somewhat pointed, much projecting beyond the lower jaw. Minute teeth in both jaws; maxillary dilated and obliquely truncated behind, extending to the mandibulary joint. Gill-rakers fine and closely set, the longest as long as the eye. Origin of the dorsal fin somewhat nearer to the end of the snout than to the root of the caudal. The anal fin commences at a short distance behind the last dorsal ray. Abdomen trenchant, with spiny scutes, which do not extend forwards to the root of the pectorals. Pectoral fins just reaching the ventrals. Coloration uniform.

Madagascar.

a. Four and a half inches long. Presented by Dr. J. E. Gray.

22. Engraulis spinifer.

Cuv. & Val. xxi. p. 39.

B. 14. D. 15. A. 37–38.

The height of the body is a little less than the length of the head, which is one-fourth of the total (without caudal). Snout pointed, much projecting beyond the lower jaw. Minute teeth in both jaws. Maxillary tapering, extending to the gill-opening. Suboperculum projecting beyond the opercular margin, forming a small triangular prominence. Gill-rakers fine, lanceolate, shorter than the eye.

rather widely set, about 16 on the lower branch of the outer branchial arch. Origin of the dorsal fin considerably nearer to the end of the snout than to the root of the caudal; anal fin commencing below the posterior third of the dorsal. Abdomen compressed, without scutes. Pectoral fins extending to the ventrals. Coloration uniform.

Guyanas.

a. Six inches long. British Guyana. Purchased of Mr. Scrivener.

23. Engraulis compressus.

Girard, U. S. Pac. R. R. Exped. Fish. p. 336.

D. 13. A. 38.

The height of the body equals the length of the head, and is one-fifth of the total (with the caudal). Maxillary extending to the interoperculum. Origin of the dorsal fin nearer to the root of the caudal than to the end of the snout. Anal fin commencing below the middle of the dorsal. Pectorals reaching to the ventrals. A silvery band along the side of the body. (*Girard.*)

San Diego (California).

b. *The maxillary extends backwards beyond the gill-opening:* Thrissa.

24. Engraulis malabaricus.

? *Russell*, ii. pl. 194.
Clupea malabarica, *Bloch*, pl. 432.
Engraulis malabarica, *Cuv. & Val.* xxi. p. 63, pl. 609; *Day, Fish. Malab.* p. 239.

B. 13–14. D. 14. A. 40. L. lat. 41.

The height of the body is two-sevenths or one-third of the total length (without caudal), the length of the head nearly two-ninths. Both jaws with minute teeth; the maxillary is dilated above the mandibulary joint, and its posterior tapering portion extends only a little beyond the gill-opening. Origin of the dorsal fin midway between the end of the snout and the root of the caudal. Anal fin commencing immediately behind the last dorsal ray. The entire abdominal edge serrated. Scapulary region with black venules; head and pectoral minutely dotted with brownish black in mature specimens.

Coast of Malabar.

a–b. Adult. From the Collection of the Zoological Society.

25. Engraulis hamiltonii.

Thrissa hamiltonii, *Gray, Ind. Zool.* c. fig. (scales too large).
Thryssa mystax, *Richards. Ichthyol. Chin.* p. 309.
Engraulis mystax, *Cantor, Mal. Fish.* p. 307.
—— grayi, *Bleek. Verh. Bat. Gen.* xxiv. *Haring*, p. 41; and *Nat. Tydschr. Ned. Ind.* ii. p. 492; *Kner, Novara, Fisch.* p. 333.

B. 13. D. 13. A. 36–40. L. lat. 47.

The height of the body is contained thrice and one-half or thrice and three-fourths in the total length (without caudal), the length of the head four times and one-fourth or four times and a half. Both jaws with minute teeth; the maxillary is dilated above the mandibulary joint, and its posterior tapering portion extends to, or nearly to, the root of the pectoral fin. Origin of the dorsal fin midway between the end of the snout and the root of the caudal. Anal fin commencing immediately behind the last dorsal ray. The entire abdominal edge serrated. Scapulary region with black venules. Gill-rakers rather strong, distant, 13 on the horizontal branch of the outer branchial arch; the longest are rather shorter than the eye.

East Indies; China.

a, *b*. Adult. China.
c. Adult: stuffed. China. Presented by J. R. Reeves, Esq.
d, *e*. Adult. Moluccas.
f. Adult. Sumatra.
g. Half-grown: skin. Pinang. From Dr. Cantor's Collection.

26. Engraulis mystacoides.

Engraulis hamiltonii, *Cuv. & Val.* xxi. p. 66 (not *Gray*); *Kner, Novara, Fisch.* p. 334.
? Engraulis mystax, *Cuv. & Val.* xxi. p. 67 (not *Bl. Schn.*).
Thryssa porava, *Bleek. Verh. Bat. Gen.* xxii. *Madura*, p. 14 (not *Ham. Buch.*).
Engraulis mystacoides, *Bleek. l. c.* xxiv. *Haring*, p. 42.
—— mystax, *Bleek. l. c.* p. 43 (not *Bl. Schn.*).
Stolephorus (Thryssa) valenciennesii, *Bleek. Ned. Tydschr. Dierk.* iii. 1866, p. 306.

B. 13. D. 13–14. A. 35–40. L. lat. 42.

The height of the body is contained thrice and four-fifths to four times in the total length (without caudal), the length of the head four times or four times and one-sixth. Snout short, rather obtuse, projecting beyond the lower jaw. Teeth present in both jaws, minute; maxillary much prolonged, extending to the root of the pectorals; it has a short dilatation above the mandibulary joint. Gill-rakers lanceolate, widely set, from 11 to 14 on the lower branch of the outer branchial arch, the longest as long as the eye. Origin of the dorsal fin a little nearer to the root of the caudal fin than to the end of the snout. Anal fin commencing below, or nearly below, the last dorsal rays. Abdomen compressed, the spiny scutes extending forwards to the gill-opening. A blackish spot across the scapula.

East Indies.

a. Half-grown. Amoy. Purchased of Mr. Stevens.
b. Half-grown. China.
c. Half-grown. East-Indian archipelago. From Dr. Bleeker's Collection as *Engraulis mystax*.
d. Adult. East-Indian archipelago. From Dr. Bleeker's Collection as *Engraulis mystacoides*.

27. Engraulis purava.

Poorawah, *Russell*, ii. pl. 190.
Clupea purava, *Ham. Buch. Fish. Gang.* p. 238.
Engraulis purawa, *Cuv. & Val.* xxi. p. 65; *Cant. Mal. Fish.* p. 308.

B. 12. D. 13–14. A. 45–50. L. lat. 46.

The height of the body is one-fourth of the total length (without caudal), the length of the head one-fifth. Both jaws with very small teeth; the maxillary is dilated above the mandibulary joint, and its posterior tapering portion extends to the root of the pectoral fin. Origin of the dorsal fin midway between the end of the snout and the root of the caudal. Anal fin commencing below the posterior dorsal rays. The entire abdominal edge serrated. Gill-rakers lanceolate, widely set, about seventeen on the horizontal branch of the outer branchial arch; the longest are rather shorter than the eye.

East India.

a. 170 mm. long. Kurrachee. From the Collection of Messrs. von Schlagintweit.
b. Adult: skin. Cochin. Purchased.
c. Half-grown. Calcutta. From the Collection of Messrs. von Schlagintweit.

28. Engraulis mystax.

Clupea mystax, *Bl. Schn.* p. 426, tab. 83.
Engraulis dussumierii, *Cuv. & Val.* xxi. p. 69; *Bleek. Verh. Bat. Gen.* xxiv. *Haring*, p. 48; *Kner, Novara, Fisch.* p. 333.
—— auratus, *Day, Fish. Malab.* p. 238, pl. 19. fig. 2.

B. 12. D. 13–14. A. 34. L. lat. 42.

The height of the body is contained thrice and one-third or thrice and a half in the total length (without caudal), the length of the head four times. Snout short, obtuse, much projecting beyond the lower jaw. Teeth present in both jaws, minute. Maxillary much prolonged, extending to, or nearly to, the ventrals; it has a short dilatation above the mandibulary joint. Gill-rakers not very fine, about 16 on the lower branch of the outer branchial arch, the longest as long as the eye. Origin of the dorsal fin somewhat nearer to the end of the snout than to the root of the caudal fin. Anal fin commencing at a short distance behind the last dorsal rays. Abdomen compressed, the spiny scutes extending forwards to the gill-opening. Sometimes a blackish spot across the nape down to the scapula.

East Indies.

a. Adult. Bombay. Purchased of Mr. Frank.
b. Half-grown. Madras. From Mr. Day's Collection.—*Engraulis auratus.*
c. Adult. Java. From Dr. Bleeker's Collection.

29. Engraulis setirostris.

Clupea setirostris, *Brouss. Ichth.* i. tab. 11; *L. Gm.* p. 1407; *Bl. Schn.* p. 428; *Russell*, ii. p. 80, pl. 201.
—— mystacina, *Forster, Descript. Anim.* ed. *Lichtenstein*, p. 295.

Engraulis setirostris, *Cuv. & Val.* xxi. p. 69; *Bleek. Verh. Bat. Gen.* xxiv. *Haring*, p. 44.
Thryssa macrognathus, *Bleek. l. c.* xxii. *Madura*, p. 14.

B. 9. D. 14. A. 34–36. L. lat. 44.

The height of the body is contained thrice and three-fourths in the total length (without caudal), the length of the head four times and a half or five times. Snout very short and obtuse, very little projecting beyond the lower jaw. Teeth present in both jaws, minute. Maxillary much prolonged, extending to, or nearly to, the anal; it has a short dilatation above the coronoid process of the mandible. Gill-rakers not very fine, distant, about ten on the lower branch of the outer branchial arch, the longest shorter than the eye. Origin of the dorsal fin nearly midway between the end of the snout and the root of the caudal. Anal fin commencing in the vertical from the last dorsal ray. Abdomen compressed, the spiny scutes extending forwards to the gill-opening. Scapulary region with black venules.

Indian Ocean; Pacific.

a. Adult. Indian archipelago. From Dr. Bleeker's Collection.
b. Young. From the Collection of the Zoological Society.

2. *Origin of the anal fin in advance of that of the dorsal*: Pterengraulis.

30. Engraulis atherinoides.

Clupea atherinoides, *L. Syst. Nat.* i. p. 523; *L. Gm.* p. 1406; *Bloch*, taf. 408; *Bl. Schn.* p. 427.
Engraulis atherinoides, *Cuv. & Val.* xxi. p. 31; *Kner, Novara, Fisch.* p. 332.

B. 11. D. 13. A. 31–32. L. lat. 45.

The height of the body is contained four times in the total length (without caudal), the length of the head four times and one-third. Snout obtuse, very short, much projecting beyond the lower jaw. Teeth present in both jaws, minute. Maxillary obliquely truncated behind, extending to the mandibulary joint. Gill-rakers short, lanceolate, distant, about thirteen on the lower branch of the outer branchial arch, the longest being shorter than the eye. Origin of the dorsal fin nearly midway between the root of the caudal fin and the scapula. Anal fin commencing at a short distance in advance of the first dorsal ray. Pectoral fins as long as the head, reaching beyond the ventrals. Abdomen strongly compressed, trenchant, but without spiny scutes. A silvery band along the side, very broad on the trunk, tapering on the tail.

Guyanas; Brazil.

a, b. Adult. Surinam.
c. Adult. British Guyana. Purchased of Mr. Leadbeater.
d. Adult. River Capin, Para. Purchased of Mr. Stevens.

B. *Teeth in the jaws unequal in size, some being enlarged.*

1. *Origin of the dorsal fin in advance of that of the anal*: Lycengraulis.

31. Engraulis grossidens.

Engraulis janeiro, *Spix, Pisc. Bras.* tab. 24. f. 1.
—— grossidens, (*Cuv.*) *Agass. ibid.* p. 50.
—— dentex, *Cuv. & Val.* xxi. p. 28; *Kner, Novara, Fisch.* p. 332.

B. 13. D. 15. A. 25–26. L. lat. 41.

The height of the body is nearly equal to the length of the head, and two-ninths of the total (without caudal). Snout pointed, projecting beyond the lower jaw. Teeth in both jaws, the upper very conspicuous, the lower still larger, from fourteen to eighteen on each side. Maxillary tapering, extending nearly to the gill-opening. Gill-rakers very short lanceolate lamellæ, about fifteen on the lower branch of the outer branchial arch. Origin of the dorsal fin midway between the root of the caudal and the middle of the eye; anal fin commencing below the posterior half of the dorsal. Abdomen compressed, without scutes. Pectoral fins reaching to the ventrals. A broad, not well-defined silvery band along the side.

Atlantic coasts of South America.

a. 170 mm. long. British Guyana. Purchased of Mr. Scrivener.

32. Engraulis batesii.

B. 12. D. 14. A. 26. L. lat. 46.

The height of the body is one-fifth of the total length (without caudal), the length of the head two-ninths; head two-thirds longer than deep. The diameter of the eye is much more than the length of the snout, and contained five times and a half in that of the head. Snout pointed, much projecting beyond the lower jaw. Teeth in both jaws, those in the upper very small, the lower being larger, about twenty-four on each side. Maxillary rounded behind, not dilated, extending to the mandibulary joint. Gill-rakers very short, like tubercles; there are about twelve on the lower branch of the outer branchial arch. Origin of the dorsal fin midway between the root of the caudal and the occiput; the anal fin commences below the anterior third of the dorsal. Abdomen compressed, without scutes. Pectoral fins scarcely reaching the ventrals. A broad, not well-defined silvery band along the side; an oblong blackish patch on the lower half of the end of the tail.

Pará.

a–c. Adult (9 inches) and half-grown. River Pará. Purchased of Mr. Stevens.

2. *Origin of the anal fin in advance of that of the dorsal*: Lycothrissa.

33. Engraulis crocodilus.

Bleek. Verh. Bat. Gen. xxiv. *Haring*, p. 35; or *Nat. Tydschr. Ned. Ind.* i. p. 15.

B. 13. D. 13. A. 46. L. lat. 48.

The height of the body is equal to the length of the head, and two-ninths of the total (without caudal). Snout compressed, very little projecting beyond the lower jaw. Teeth in both jaws, the upper very conspicuous and rather distant, the lower still larger, about 14 on each side. Maxillary obliquely truncated, extending to the mandibulary joint. Gill-rakers lanceolate, shorter than the eye, distant, nine on the lower branch of the outer branchial arch. Origin of the dorsal fin midway between the root of the caudal fin and the scapula, behind the origin of the anal fin. Abdomen trenchant, with spiny scutes. which extend forwards to the pectoral fins. Pectorals reaching beyond the root of the ventrals. Coloration uniform.

Borneo.

a. Type of the species. From Dr. Bleeker's Collection.

II. *The upper pectoral ray is prolonged into a filament; anal rays fifty or more.*

A. *Upper jaw prominent*: Telara.

34. **Engraulis melanochir.**

Bleek. Verh. Bat. Gen. xxii. *Madura,* p. 13, and xxiv. *Haring,* p. 36.

B. 13–14. D. 14. A. 50–52. L. lat. 53.

The height of the body is a little less than one-third of the total length (without caudal), the length of the head one-fifth. Snout very short, but slightly projecting beyond the lower jaw. Minute teeth in both jaws. Maxillary dilated and obliquely truncated behind, extending to the mandibulary joint. Gill-rakers lanceolate, widely set, the longest being as long as the eye; there are about nine on the lower branch of the outer branchial arch. Origin of the dorsal fin nearer to the root of the caudal than to the end of the snout; anal fin commencing below the anterior dorsal rays. The upper pectoral ray is produced into a short filament not extending to the anal. The whole of the abdominal edge is serrated. Uniform silvery.

East-Indian archipelago; Siam.

a. One of the typical specimens. From Dr. Bleeker's Collection.
b. Half-grown. From the Haslar Collection.

35. **Engraulis taty.**

Engraulis taty, *Cuv. & Val.* xxi. p. 60; *Cant. Mal. Fish.* p. 306; *Bleek. Verh. Bat. Gen.* xxiv. *Haring,* p. 36.
—— tenuifilis, *Cuv. & Val.* xxi. p. 62.
—— telaroides, *Bleek. l.c.* xxii. *Madura,* p. 13.

B. 13. D. 13–15. A. 51–56. L. lat. 46.

The height of the body is one-third, or rather less than one-third, of the total length (without caudal), the length of the head one-fifth. Snout short, projecting beyond the lower jaw. Minute teeth in both jaws. Maxillary dilated into a semicircular lamella behind and obliquely truncated, extending to the mandibulary joint. Gill-rakers lanceolate, not widely set, the longest being as long as the eye; there are about twenty on the lower branch of the outer branchial arch.

Dorsal fin enveloped by scales, nearer to the end of the snout than to the root of the caudal; anal fin commencing below the middle of the dorsal. The upper pectoral ray is produced into a very long filament extending to the commencement or the end of the anal fin. The whole abdominal edge is serrated. Uniform silvery.

Bengal; East-Indian archipelago.

a–c. Adult (150 mm.) and young. Bengal. Presented by G. R Waterhouse, Esq.
f. Adult: skin. Pinang. From Dr. Cantor's Collection.
g. Adult. Java. From Dr. Bleeker's Collection.

36. Engraulis telara.

Clupea telara, *Ham. Buch. Fish. Gang.* pp. 241 & 382, pl. 2. fig. 72.
—— phasa, *Ham. Buch. l. c.* pp. 240 & 382.
Engraulis brevifilis, *Cuv. & Val.* xxi. p. 54.
—— telara, *Cuv. & Val.* xxi. p. 56, pl. 608; *Bleek. Verh. Bat. Gen.* xxv. *Beng. & Hind.* p. 147.
—— phasa, *Cuv. & Val.* xxi. p. 59.

B. 13–14. D. 13. A. 70–75. L. lat. 55.

The height of the body is two-ninths of the total length (without caudal), the length of the head two-elevenths. Snout very short, but slightly projecting beyond the lower jaw. Minute teeth in both jaws. Maxillary dilated and obliquely truncated behind, extending beyond the mandibulary joint. Gill-rakers lanceolate, widely set, the longest being as long as the eye; there are about eighteen on the lower branch of the outer branchial arch. Dorsal fin much nearer to the end of the snout than to the root of the caudal; anal fin commencing in advance of the dorsal. The upper pectoral ray is produced into a sometimes very long filament. The whole abdominal edge is serrated. Uniform silvery.

Bengal; Cachar.

a. Adult. Cachar. Presented by Lieut.-Col. Playfair.
b. River Hooghly. From Dr. Bleeker's Collection.

B. *Lower jaw prominent*: Heterothrissa.

37. Engraulis breviceps.

Engraulis breviceps, *Cant. Mal. Fish.* p. 306.
—— pfeifferi, *Bleek. Nat. Tydschr. Ned. Ind.* iii. p. 433.

B. 17–18. D. 17. A. 60–63. L. lat. 56.

The snout is so short that the symphysis of the mandible is the foremost part. Eye very small. Operculum extremely narrow, leaving a portion of the gills uncovered. The height of the body is two-sevenths of the total length (without caudal), the length of the head nearly one-sixth. Minute teeth in both jaws. Maxillary with its supplementary bone of an ovate shape, truncated behind, extending to the mandibulary joint. Gill-rakers lanceolate, slightly curved, widely set, longer than the eye; there are about eleven on the lower branch of the outer branchial arch. Origin of the dorsal fin midway between the end of the snout and the root of the caudal; anal fin commencing in advance of the dorsal. The upper pectoral ray is produced into a sometimes very long filament. The whole abdominal edge is serrated. Vertical fins with black margins.

Pinang; Borneo.

a. Type of the species: skin. Pinang. From Dr. Cantor's Collection.

b. Type of *E. pfeifferi*. Borneo. From Dr. Bleeker's Collection.

3. COILIA*

Mystus, *Lacép.* v. p. 466.
Coilia, *Gray, Zool. Misc.* 1831, p. 9.
Chætomus, *M'Clell. Calc. Journ. Nat. Hist.* iv. 1843, p. 405.

Body compressed, terminating in a long tapering tail. Scales of moderate size. Snout, jaws, and dentition as in *Engraulis*. Anal fin exceedingly long, confluent with the caudal. The two or three upper pectoral rays are much prolonged, and their branches form four, six, or seven filaments. Branchial apparatus as in *Engraulis*.

Indian and Chinese seas.

The species may be arranged thus:—

I. Maxillary not extending backwards beyond the head.
  A. Anal rays more than 70, p. 402.
  B. Anal rays about 40, p. 404.
II. Maxillary extending backwards beyond the head, p. 404.

I. *Maxillary not extending backwards beyond the head.*

A. *Anal rays more than seventy.*

1. Coilia ramcarati.

Mystus ramcarati, *Ham. Buch. Fish. Gang.* p. 233.
Engraulis (Coilia) hamiltonii, *Gray, Ind. Zool.* c. fig.
Coilia hamiltoni, *Cuv. & Val.* xxi. p. 79.
—— reynaldi, *Bleek. Verh. Bat. Gen.* xxv. *Beng. & Hindost.* p. 143.
—— rebentischi, *Bleek. Act. Soc. Sc. Indo-Neerl. & Borneo,* xii. p. 5.

B. 11. D. 13. A. 94–110. L. lat. 70.

Six pectoral filaments. Maxillary obliquely truncated behind, extending to the mandibulary joint. The length of the head is nearly one-sixth of the total (without caudal); diameter of the eye one-fifth of the length of the head. The distance between the vertical from the first dorsal ray and the end of the snout is contained thrice and two-thirds in the total length (without caudal). Abdomen not serrated in front of the ventrals. Gill-rakers fine, closely set, the longest as long as the eye; there are about twenty-eight on the lower branch of the outer branchial arch.

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* 1. Coilia reynaldi, *C. & V.* xxi. p. 81.—Irawaddy.
2. —— cantoris, *Bleek. Verh. Bat. Gen.* xxv. p. 148.—River Hooghly.
  a. Type of the species (100 mm. long), in bad state. From Dr. Bleeker's Collection. This example is young and ought not to have been made the type of a distinct species.

Hindostan; Borneo.

a. Type of the species. Ganges. Presented by G. R. Waterhouse, Esq.
b. Adult. Calcutta. From the Collection of Messrs. von Schlagintweit.
c. Half-grown. India.
d. Type of *C. rebentischi*. Borneo. From Dr. Bleeker's Collection.

2. Coilia quadrifilis.

Coilia reynaldi, *Cant. Mal. Fish.* p. 310 (not *Cuv. & Val.*).

B. 10. D. 16. A. 107–116.

Four pectoral filaments. Maxillary obliquely truncated behind, extending to the mandibulary joint. The length of the head is one-sixth of the total (without caudal); the diameter of the eye is one-fourth of the length of the head. Abdomen serrated in front of the ventrals. One or two series of distant rounded spots of shining gold along the lower half of the body.

Pinang; Malayan peninsula; Singapore.

a–b. Skins, 7 inches long, not in good state. From Dr. Cantor's Collection as *Coilia reynaldi*.

3. Coilia dussumieri.

Coilia dussumieri, *Cuv. & Val.* xxi. p. 81, pl. 610; *Bleek. Verh. Bat. Gen.* xxiv. *Haring*, p. 45; *Hyrtl, Denkschr. Ak. Wiss. Wien*, x. 1855.

Leptonurus chrysostigma, *Bleek. Verh. Bat. Gen.* xxii. *Madura*, p. 14.

B. 11. D. 14. A. 80–85. L. lat. 70. Cæc. pyl. 8.

Six pectoral filaments. Maxillary tapering behind, extending nearly to the gill-opening. The length of the head is a little less than one-fifth of the total (without caudal); diameter of the eye two-ninths of the length of the head. The distance between the vertical from the first dorsal ray and the end of the snout is one-third of the total length (without caudal). Serrature of the abdomen very conspicuous. Gill-rakers fine, closely set, the longest as long as the eye; there are about twenty-five on the lower branch of the outer branchial arch. Three series of brilliant pearl-coloured spots along the lower half of the body.

East Indies.

a. 150 mm. long. From Dr. Bleeker's Collection.

4. Coilia borneensis.

Bleek. Verh. Bat. Gen. xxiv. *Haring*, p. 45; or *Nat. Tydschr. Ned. Ind.* iii. p. 437.

B. 9. D. 13. A. 84–87. L. lat. 50.

Six pectoral filaments. Maxillary tapering to a fine point, extending nearly to the gill-opening. The length of the head is two-ninths of the total (without caudal); the diameter of the eye nearly one-fifth of the length of the head. The distance between the vertical from the first dorsal ray and the end of the snout is contained thrice and one-fifth in the total length (without caudal). Abdomen not serrated in front of the ventrals. Gill-rakers very fine, closely set; the longest shorter than the eye; there are about twenty-six on the lower branch of the outer branchial arch.

Sumatra; Borneo.

a. One of the typical specimens (120 mm. long). From Dr. Bleeker's Collection.

B. *Anal rays about forty.*

5. **Coilia quadragesimalis.**

Cuv. & Val. xxi. p. 83.

B. 10. D. 15. A. 42.

Six pectoral filaments. Maxillary truncated behind, not extending beyond the mandibulary joint. Tail not very low, its depth in front of the caudal fin being one-third of that of the body. (*Val.*)

Ganges.

II. *Maxillary extending backwards beyond the head.*

6. **Coilia clupeoides.**

Clupea mystus, *L. Amœn. Acad.* iv. p. 252. fig. 12 (made from an imperfect specimen); *Osbeck, Iter*, p. 256.
Mystus clupeoides, *Lacép.* v. p. 467.
Chætomus playfairii, *M'Clell. Calc. Journ. Nat. Hist.* iv. 1843, p. 405, tab. 24. fig. 3.
Coilia playfairii, *Richards. Voy. Sulph. Fish.* p. 100, pl. 54. figs. 3–4; *Cuv. & Val.* xxi. p. 86.
Engraulis mystus, *Cuv. & Val.* xxi. p. 73.
Osteoglossum prionostoma, *Basil. Nouv. Mém. Soc. Nat. Mosc.* x. 1855, p. 244.

B. 9. D. 13. A. 70–86. L. lat. 58.

Six pectoral filaments. Maxillary tapering behind, extending to below the root of the pectorals. The length of the head is rather more than one-sixth of the total (without caudal); the diameter of the eye two-ninths of the length of the head. The distance between the vertical from the first dorsal ray and the end of the snout is contained thrice and three-fourths in the total length (without caudal). Serrature of abdomen very conspicuous. Gill-rakers fine, closely set, the longest scarcely as long as the eye; there are about twenty-four on the lower branch of the outer branchial arch.

Chinese Seas.

a, b, c, d–f, g–k. Adult (190 mm.), half-grown, and young.

7. Coilia lindmani.

Coïlia lindmani, *Bleek. Act. Soc. Sc. Indo-Neerl.* iii. *Sumatra,* vi. p. 48.

B. 11. D. 13. A. 77. L. lat. 50.

Six pectoral filaments. Maxillary tapering behind, extending to below the root of the pectorals. The length of the head is a little less than one-fifth of the total length (without caudal); the diameter of the eye is one-fourth of the length of the head. The distance between the vertical from the first dorsal ray and the end of the snout is contained thrice and one-fourth in the total length (without caudal). Serrature of abdomen very conspicuous. Gill-rakers fine, closely set, the longest shorter than the eye; there are about thirty-four on the lower branch of the outer branchial arch.

Sumatra.

a. Type of the species, 176 mm. long. Palimbang. From Dr. Bleeker's Collection.

8. Coilia grayi.

Richards. Voy. Sulph. Fish. p. 99, pl. 54. figs. 1 & 2; *Kner, Novara, Fische,* p. 335.

B. 10. D. 13. A. 92. L. lat. 62.

Seven pectoral filaments. Maxillary tapering behind, extending to below the root of the pectorals. The length of the head is rather more than one-sixth of the total (without caudal); the diameter of the eye is one-fifth of the length of the head. The distance between the vertical from the first dorsal ray and the end of the snout is contained thrice and three-fourths in the total length (without caudal). Serrature of abdomen very conspicuous. Gill-rakers rather fine, closely set, the longest scarcely as long as the eye; there are about twenty-eight on the lower branch of the outer branchial arch.

China.

a. Type of the species, 270 mm. long. From the Haslar Collection.
b. Adult. Presented by J. R. Reeves, Esq.
c. Adult: stuffed. Presented by J. R. Reeves, Esq.
d–e. Half-grown and young. From the Haslar Collection.

9. Coilia nasus.

Collia nasus, *Schleg. Faun. Japon. Poiss.* p. 243, pl. 109. fig. 4.
Coilia grayi, *Kner, Novara, Fisch.* p. 335 (not *Rich.*).

B. 11. D. 13. A. 85–100. L. lat. ca 60.

Six pectoral filaments. Maxillary tapering behind, extending to below the root of the pectorals. The length of the head is rather more than one-seventh of the total (without caudal), the diameter of the eye two-ninths or one-sixth of the length of the head. The distance between the vertical from the first dorsal ray and the end of the snout is one-fourth, or nearly one-fourth, of the total length (without caudal). Serrature of abdomen very conspicuous. Gill-rakers fine, closely set, the longest rather longer than the eye; there are twenty-two or twenty-five on the lower branch of the outer branchial arch.

China and Japan.

a. Adult (200 mm. long). Japan.
b. Fine specimen. Ningpo. Purchased of Mr. Cuming.
c–d. Fine specimens. Amoy. Purchased of Mr. Stevens.
e–f. Half-grown. China. From the Collection of the East-India Company.

10. **Coilia macrognathus.**

Bleek. Verh. Bat. Gen. xxiv. *Haring*, p. 50, or *Nat. Tydschr. Ned. Ind.* ii. p. 436.

B. 10. D. 14. A. 62–73. L. lat. 62.

Six pectoral filaments. Maxillary produced into a long, sword-shaped process, extending beyond the root of the pectorals. The length of the head is rather less than one-fifth of the total length (without caudal); the diameter of the eye is one-fifth of the length of the head. The distance between the vertical from the first dorsal ray and the end of the snout is contained thrice and two-thirds in the total length (without caudal). Serrature of abdomen very conspicuous. Gill-rakers fine, closely set; the longest rather longer than the eye: there are about twenty-five on the lower branch of the outer branchial arch.

Borneo.

a. Type of the species (9 inches long). From Dr. Bleeker's Collection.

Second Group. CHATOËSSINA.

Mouth transverse, inferior or subinferior, narrow, without teeth; upper jaw overlapping the lower; abdomen serrated.

4. CHATOËSSUS *.

Chatoëssus, sp., *Cuv. Règne Anim.*
Chatoëssus, *Cuv. & Val.* xxi. p. 94.

Body compressed, abdomen serrated. Scales of moderate size. Snout obtuse, or obtusely conical, more or less projecting beyond the cleft of the mouth, which is narrow, more or less transverse.

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* 1. Kome, *Russell*, ii. p. 76, pl. 196.—Coromandel.
2. Chatoëssus osbeckii, *C. & V.* xxi. p. 106.—China.—D. 15. A. 24; a dorsal filament.
3. —— chrysopterus, *Richards. Ichth. Chin.* p. 308.—China.—Established from a rude drawing; a dorsal filament.
4. Clupanodon manmina, *Ham. Buch.* p. 247; Chatoëssus manmina. *C. & V.* xxi. p. 114.—Bengal.—D. 14. A. 24; no dorsal filament; a humeral spot.
5. Chatoëssus tampo, *C. & V.* xxi. p. 117.—East Indies.—From a drawing.

Maxillary joined to the ethmoid, its upper portion being behind the intermaxillary. Teeth none. Anal fin rather long; dorsal opposite to the ventrals, or to the space between ventrals and anal. Gill-membranes entirely separate; branchial arches forming two angles, one pointing forwards and the other backwards; the fourth branchial arch with an accessory organ; branchiostegals of moderate length, five or six in number.

Coasts and fresh waters of North and Central America, Australia, and the East Indies.

On the accessory branchial organ and the intestines see Hyrtl, Denkschr. Ak. Wiss. Wien, x. 1855, pp. 49, 52 (*Chatoëssus chacunda*, *Gonostoma javanicum*).

α. The last dorsal ray filiform.

1. Chatoëssus nasus.

Clupea nasus, *Bl.* tab. 429; *Russell*, ii. pl. 197.
Chatoëssus altus, *Gray, Ind. Zool.* c. fig.; *Day, Fish. Malab.* p. 243.
—— nasus, *Cuv. & Val.* xxi. p. 104; *Bleek. Nat. Tydschr. Ned. Ind.* ii. p. 223.

B. 5. D. 16. A. 20–22. L. lat. 50. L. transv. 19.

The last dorsal ray filiform. The height of the body is contained twice and one-third in the total length (without caudal), the length of the head nearly four times. Snout subconical, much projecting beyond the mouth; cleft of the mouth nearly twice as wide as deep. Origin of the dorsal fin nearer to the end of the snout than to the root of the caudal. Ventral below the middle of dorsal.

East Indies.

a–b. Adult: skins. Cochin. Purchased.
c, d. Adult. Java.
e, f–h. Half-grown and young. Amboyna. Purchased of Mr. Frank.
i. Adult. Philippine Islands. Purchased of Mr. Cuming.
k. Half-grown. From the Haslar Collection.

2. Chatoëssus erebi.

Chatoësus come, *Richards. Voy. Ereb. & Terr. Fish.* p. 62, pl. 38. figs. 7–10 (not synon.).

B. 5. D. 14. A. 21. L. lat. 45–49. L. transv. 17–21.

The dorsal filament reaches to the end of the anal fin, or to the caudal. Scales not deciduous. The height of the body is contained twice and one-fifth in the total length (without caudal), the length of the head four times and one-fourth. The diameter of the eye is more than the length of the snout, and two-ninths of that of the head. Snout projecting beyond the cleft of the mouth, which is nearly transverse. Origin of the dorsal fin nearer to the end of the snout than to the root of the caudal fin, and behind the base of the ventrals. Coloration uniform.

Australia.

a. Very fine specimen, 16 inches long. New South Wales. From Mr. Krefft's Collection.
b. Adult: stuffed. Purchased of Mr. Gould.
c–f. Young: skins. Bowman's Creek near the Namoi, New South Wales.
g, h–i. Fine specimens. Cape York. From Hr. Dämel's Collection.
k. Adult: skeleton. Cape York. From Hr. Dämel's Collection.

3. Chatoessus punctatus.

Chatoëssus punctatus, *Schleg. Faun. Jap. Poiss.* p. 241, tab. 109. fig. 1; *Cuv. & Val.* xxi. p. 107; *Bleek. Verh. Bat. Gen.* xxv. *Japan*, p. 50; *Kner, Novara, Fisch.* p. 336.
—— aquosus, *Richards. Ichthyol. Chin.* p. 307; *Cuv. & Val.* xxi. p. 109.
? Chatoëssus punctatus, *Kner, Novara, Fisch.* p. 336.

B. 6. D. 16. A. 22–23. L. lat. 56. L. transv. 22.

The dorsal filament reaches to the end of the anal fin, or to the caudal. Scales not deciduous. The height of the body is contained thrice and one-fourth or thrice and a half in the total length (without caudal), the length of the head four times. The diameter of the eye is equal to the length of the snout, and two-ninths of that of the head. Upper jaw conical, projecting beyond the cleft of the mouth, rather wider than deep, the lateral portion of the maxillary being well developed and extending beyond the front margin of the eye. Origin of the dorsal fin nearer to the end of the snout than to the root of the caudal fin, and somewhat in advance of the base of the ventrals. A continuous line of dark spots along each dorsal series of scales.

Chinese and Japanese Seas.

a. Adult, 8½ inches long. Japan. From Dr. Bleeker's Collection.
b. Adult. Amoy. Purchased of Mr. Stevens.
c. Adult: stuffed. China. Presented by J. R. Reeves, Esq.—Type of *Ch. aquosus.*

4. Chatoëssus petenensis.

Meletta petenensis, *Günth. Proc. Zool. Soc.* 1866, p. 603.

B. 6. D. 14–15. A. 20–23. L. lat. 40.

The dorsal filament reaches to the end of the anal fin. Scales very deciduous. The height of the body is contained twice and three-fourths or thrice in the total length (without caudal), the length of the head thrice and a half. The diameter of the eye is rather more than the length of the snout, and two-sevenths of that of the head. Jaws even in front. Cleft of the mouth rather wider than deep, the lateral portion of the maxillary being well developed, and extending to below the front margin of the eye. Origin of the dorsal fin nearer to the end of the snout than to the root of the caudal fin, *and in advance of the base of the ventrals.* Abdomen sharply serrated, there being twelve scutes behind the ventrals. Silvery, a small round blackish spot on the shoulder.

Lake Peten.

a–d. Typical specimens, 3–4 inches long. From Mr. Salvin's Collection.

5. Chatoëssus mexicanus.

B. 6. D. 14. A. 25. L. lat. 40. L. transv. 13.

The dorsal filament reaches to the end of the anal fin. Scales very deciduous. The height of the body is contained twice and three-fourths in the total length (without caudal), the length of the head thrice and one-fifth. The diameter of the eye equals the length of the snout, and is one-fourth of that of the head. Jaws even in front. Cleft of the mouth wider than deep, the lateral portion of the maxillary being well developed, and extending to below the front margin of the eye. Origin of the dorsal fin midway between the end of the snout and the root of the caudal, *immediately behind the base of the ventrals.* Abdomen sharply serrated, there being nine scutes behind the ventrals. Silvery, a small round blackish spot on the shoulder.

Central America.

a–b. Four inches long. Mexico. From M. Sallé's Collection.
c. Young. New Orleans.
d. Several examples, from 3 to 4 inches long. Purchased of Mr. Cuming.—Said to be from Boero, East Indies.

6. Chatoëssus maculatus.

Richards. Ichthyol. Chin. p. 308; *Cuv. & Val.* xxi. p. 108.

B. 6. D. 15. A. 26–28. L. lat. 48. L. transv. 20.

The dorsal filament reaches to the end of the anal fin. Scales very deciduous. The height of the body is contained twice and three-fourths in the total length (without caudal), the length of the head thrice and a half. The diameter of the eye is equal to the length of the snout, and two-ninths of that of the head. Jaws nearly even in front. Cleft of the mouth deeper than wide, the lateral portion of the maxillary being well developed, and extending beyond the front margin of the eye. Origin of the dorsal fin nearer to the end of the snout than to the root of the caudal fin, and conspicuously in advance of the base of the ventrals. A blackish spot on the shoulder, sometimes followed by a series of similar spots.

China; Formosa.

a–c. From 6 to 9 inches long. Formosa. From Consul Swinhoe's Collection.

7. Chatoëssus cepedianus.

Megalops cepediana, *Lesueur*, *Journ. Ac. Nat. Sc. Philad.* i. 1817, p. 361.
Chatoëssus cepedianus, *Cuv. & Val.* xxi. p. 99, pl. 612.

Chatoëssus ellipticus, *Kirtland, Report Zool. Ohio,* pp. 169, 195; *Bost. Journ. Nat. Hist.* iv. p. 235, pl. 10. fig. 1.
—— insociabilis, *Abbott, Proc. Ac. Nat. Sc. Philad.* 1860, p. 365.

B. 6. D. 13. A. 30–33. L. lat. 55. L. transv. 21.

The last dorsal ray prolonged into a filament of moderate length. The height of the body is contained twice and three-fifths in the total length (without caudal), the length of the head four times. Snout slightly projecting beyond the mouth. Origin of the dorsal fin nearer to the end of the snout than to the root of the caudal, but behind the base of the ventrals. Coloration uniform, many specimens with a dark spot on the shoulder.

United States.

a–e. Adult and half-grown: skins. New York. Purchased of Dr. Parnell.

β. The last dorsal ray not prolonged.

8. **Chatoëssus cortius.**

Clupanodon cortius, *Ham. Buch. Fish. Gang.* pp. 249, 383.
Chatoëssus cortius, *Cuv. & Val.* xxi. p. 115.

D. 14. A. 25. L. lat. 58. L. transv. 23.

No dorsal filament. Scales rather irregularly arranged. The height of the body is contained twice and three-fourths in the total length (without caudal), the length of the head four times. Snout obtusely conical, projecting beyond the cleft of the mouth, which is nearly transverse. Origin of the dorsal fin somewhat nearer to the end of the snout than to the root of the caudal, and opposite to the base of the ventrals. Uniform silvery, with or without humeral spot.

Bengal; Cachar.

a–d. Adult and half-grown. Bengal. Presented by G. R. Waterhouse, Esq.
e. Adult. Cachar. Presented by Lieut.-Col. Playfair.

9. **Chatoëssus chanpole.**

Clupanodon chanpole, *Ham. Buch. Fish. Gang.* pp. 249, 383, pl. 18. fig. 74.
Chatoëssus chanpole, *Cuv. & Val.* xxi. p. 116.

D. 15. A. 21. L. lat. 46. L. transv. 19.

No dorsal filament. Scales regularly arranged. The height of the body is two-fifths of the total length (without caudal), the length of the head a little more than one-fourth. Snout not much projecting beyond the cleft of the mouth, which is nearly transverse. Origin of the dorsal fin nearer to the end of the snout than to the root of the caudal, and scarcely in advance of the base of the ventrals. A blackish spot on the shoulder, followed by several other similar but smaller spots. (These spots disappear more or less in preserved examples.)

Bengal.

a. Skin; 6 inches long. Purchased.

10. Chatoëssus chacunda

Clupanodon chacunda, *Ham. Buch. Fish. Gang.* p. 246.
Chatoëssus chacunda, *Cuv. & Val.* xxi. p. 111; *Cant. Mal. Fish.* p. 311; *Bleek. Verh. Bat. Gen.* xxiv. *Haring*, p. 47.
Anodontostoma hasseltii, *Bleek. Verh. Bat. Gen.* xxii. *Madura*, p. 15.
Chatoëssus selangkat, *Bleek. l. c.* xxiv. p. 47; or *Nat. Tydschr. Ned. Ind.* iii. p. 458*.

B. 6. D. 17–18. A. 20. L. lat. 40. L. transv. 13–14.

No dorsal filament. Scales regularly arranged. The height of the body is contained from twice to twice and a half in the total length (without caudal), the length of the head four times or thrice and three-fourths. Snout much projecting beyond the cleft of the mouth, which is nearly transverse. Origin of the dorsal fin much nearer to the end of the snout than to the root of the caudal, the ventrals being inserted below its middle. A round black spot on the shoulder.

East Indies.

α. *The height of the body is one-half, or a little less than one-half, of the total length (without caudal)*: var. *altior*.

a. Adult: skin. Cochin. Purchased.
b–d. Adult. Ganges. Presented by G. R. Waterhouse, Esq.
e–f. Fine specimens. Siam. Purchased of Mr. Jamrach.
g. Half-grown. Borneo. Presented by the Marquis Doria.

β. *The height of the body is contained about twice and two-fifths in the total length (without caudal)*: var. *chacunda*.

h. Half-grown. Ganges. Presented by G. R. Waterhouse, Esq.
i. Adult: skin. Pinang. From Dr. Cantor's Collection.
k. Adult. Sumatra.
l, m, n. Adult. East-Indian archipelago.

γ. *The height of the body is two-fifths of the total length (without caudal)*: var. *selangkat*.

o. One of the typical specimens of *Ch. selangkat*. From Dr. Bleeker's Collection.

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* The fish described by Kner (Novara, Fisch. p. 337) under this name is evidently a very different species.

Third Group. CLUPEINA.

Upper jaw not overlapping the lower; abdomen serrated.

5. CLUPEA*.

Clupea, sp., *Artedi.*
Clupea, *Cuv. Règne Anim.*
Clupea, Sardinella, Harengula, Rogenia, Clupeonia, Spratella, Kowala, Meletta, *et* Alausa, *Valenciennes.*
Clupalosa, &c., *Bleek. Verh. Bat. Gen.* xxii. *Madura*, p. 12.
Alausella, Pomolobus (*Rafinesque*), Opisthonema, Brevoortia, &c., *Gill, Proc. Acad. Nat. Sc. Philad.* 1861, pp. 35–37.
Sardinia, *Poey.*

Body compressed, with the abdominal serrature extending forwards into the thoracic region. Scales of moderate or large, rarely of small size. Upper jaw not projecting beyond the lower. Cleft of the mouth of moderate width; teeth, if present, rudimentary and deciduous. Anal fin of moderate extent, with less than thirty rays; dorsal fin opposite to the ventrals. Caudal forked.

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* 1. Clupea lineolata, *Cuv. & Val.* xx. p. 256.—From Pallas's Collection. See p. 415.

2. Meletta sueurii, *Cuv. & Val.* xx. p. 375.—Wabash.—D. 17. A. 21.

3. Clupea alosa, *Schoepff, Beobacht. ntrf. Freund. Berl.* viii. p. 180; *Mitch. Trans. Lit. & Phil. Soc. New York*, i. p. 449; Clupea tyrannus, *Latrobe, Am. Phil. Soc. Trans.* v. p. 77, pl. 1; Clupea indigena, *Mitchill, l. c.* p. 454 (young?); Clupea vernalis, *Mitchill, l. c.*; Alosa vulgaris, *Storer, Rep. Ichth. Massach.* p. 116; Alosa vernalis, *Storer, l. c.* p. 114; Alosa præstabilis, *Dekay, New York Faun. Fish.* p. 255, pl. 15. fig. 41; *Cuv. & Val.* xx. p. 421; *Storer, Mem. Amer. Acad.* vi. p. 332, pl. 26. fig. 2.—Numerous as the descriptions of this fish are, not one is exact enough to show the characters by which it may be distinguished from the European Shads.

4. Alosa (Pomolobus) chrysochloris, *Rafin. Ichthyol. Ohio*, p. 39; *Kirtland, Bost. Journ. Nat. Hist.* iv. p. 307, pl. 15. fig. 3.—Ohio.

5. Clupea laticosta, *Lowe, Proc. Zool. Soc.* 1843, p. 90.—Madeira.—D. 18. A. 20. Opercle striated; closely allied to *C. pilchardus.*

6. Alosa immaculata, *Bennett, Proc. Zool. Soc.* 1835, p. 92.—Trebizond.—D. 17. A. 18.

7. Clupea cultriventris, *Nordmann, in Demid. Voy. Russ. Mérid.* iii. p. 522. —Black Sea.—D. 14. A. 18; teeth none.—The description is not only insufficient, but evidently incorrect: the author states first that the specimen is 3 inches long and 10 lines deep; afterwards that the height of the body is equal to the length of the head, and two-ninths of the total (with the caudal).

8. Clupea delicatula, *Nordm. l. c.* p. 524.—Black Sea.—D. 15. A. 20. No teeth.

9. Sardinella lineolata, *Cuv. & Val.* xx. p. 272.—Ceylon.—D. 18. A. 17. Posterior frontals not striated.

10. Alausa schrammi, *Bleek. Verh. Bat. Gen.* xxii. *Bali*, p. 11; Meletta schrammi, *Bleek. ibid.* xxiv. *Haring*, p. 30.—Bali.

a. One of the typical specimens. From Dr. Bleeker's Collection. This example is in so bad a condition as to be useless for comparison with the other allied species; and as no specific differences are pointed out in Dr. Bleeker's description, the species must remain doubtful at present.

11. Clupea flosmaris, *Richards. Ichth. Chin.* p. 305.—China.—Named from a drawing.

12. —— punctata, *Rüpp. N. W. Fische*, p. 78, taf. 21. fig. 2; probably = *Cuv. & Val.* x. p. 297.—Red Sea. See p. 425.

a. Skin. Zanzibar. From Lieut.-Col. Playfair's Collection.

Inhabitants of the coasts of every part of the globe; many species entering fresh waters.

No more unfortunate method could be adopted for the systematic arrangement of a group of animals than one based exclusively on differences in an organ which has become rudimentary in that group, and consequently subject to even individual variations. The number of toes in Saurians, the presence of certain fins, of barbels, &c. in fishes, are characters fit for generic distinction whilst those organs are normally developed; but they cease to have that significance when those organs are rudimental, as in many Scincoid, Siluroid, and Cyprinoid forms. In Cuvier's genus *Clupea* the dentition is rudimental; the teeth in the jaws are more or less completely lost in a number of individuals, either by accident or by age; those on the tongue, if present, are a more constant part of the dentition; yet there are numerous species in which the lingual teeth are few in number and as readily lost as those in the jaws. Nearly the same

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13. Clupea quadrimaculata, *Rüpp. N. W. Fische*, p. 78, taf. 21. fig. 3; Harengula bipunctata, *Cuv. & Val.* xx. p. 298; ? Harengula arabica, *Cuv. & Val.* xx. p. 298.—Red Sea.
14. Harengula abbreviata, *Cuv. & Val.* xx. p. 296.—New Holland.
15. Meletta obtusirostris, *Cuv. & Val.* xx. p. 375.—Seychelles.
16. Alausa cærulea, *Cuv. & Val.* xx p. 432; *Gay, Chile, Zool.* ii. p. 323.—Chile.
17. —— argyrochloris, *Cuv. & Val.* xx. p. 440.—Indian Ocean.
18. Clupea mauritiana, *Benn. Proc. Zool. Soc.* i. p. 32.—Mauritius.
19. —— ovalis, *Benn. in Mem. Raffles*, p. 690.—Sumatra.—"D. 18. A. 17. Clup. corpore ovali: pinna dorsali media, antice elevata; macula humerali nigra."
20. Alausa teres, *Cuv. & Val.* xx. p. 423 (not *Dekay*).—Philadelphia.
21. Harengula spilurus, *Guichenot, in Maillard, Ile de la Réunion, Poiss.* p. 16.—Bourbon.—D. 17. A. 19. The height of the body is equal to the length of the head, which is one-fourth of the total (with the caudal).
22. Clupea inermis, *Basil. Nouv. Mém. Soc. Nat. Mosc.* x. 1855, p. 242.—North China.—Abdomine non dentato; dorsalis abdominalium primo radio opposita; analis elongata; lingua aspera.
23. Clupeonia fasciata, *Cuv. & Val.* xx. p. 349.—Bourbon.
24. Clupea fuegensis, *Jenyns, Voy. Beagle, Fish.* p. 134.—Tierra del Fuego. —I have examined the typical example, which is preserved in the Museum of the University of Cambridge. It has lost all its scales, and is evidently a young fish, which ought not to have been made the type of a species. The dentition is by no means that of the Herring as Jenyns states; it has no trace of teeth on the palate, and certainly never had any on the vomer; there is, perhaps, a longitudinal series on the tongue. This fish cannot be admitted into the system before its characters are better known from fresh examples obtained in the same seas.
25. Harengula jaguana, *Poey, Repert. Fis.-nat. Cub.* 1865, p. 189.—South coast of Cuba.
26. Alausa striata, *Cuv. & Val.* xx. p. 429.—Guadeloupe.

may be said with regard to the teeth on the palate; and innumerable instances may be met with in which it is impossible to say whether a certain bone has been provided with teeth or not. However, in the few species provided with an ovate patch of vomerine teeth these are constant.

Such is the uncertainty of the character employed by Valenciennes for the division of the Herrings; and serious errors in the distinction and arrangement of the species, committed by him and those who followed him, were the natural consequence of such a method. He twice describes the common Sprat, referring it to two different genera; the young of the Herring is made the type of a distinct genus, to which Bleeker adds a second, East-Indian species, which has less natural affinity to the European Herring than any other of the species of *Clupea*! Girard describes the Californian Pilchard twice, under two generic names, &c. Finally, one and the same species is described by one author as toothless, whilst another mentions teeth on one or more parts of the mouth.

In the following arrangement of the species I have used the dentition only as far as it appeared to be a safe guide for the recognition of the species; no mention whatever is made of the teeth in the jaws, as they are the least reliable part of the dentition.

Synopsis of the Species.

I. A conspicuous ovate patch of minute teeth on the vomer (*Clupea*), p. 415.

II. Minute teeth on the palate, none on the vomer.
  A. Atlantic species.
    a. Root of the ventral opposite to the origin of the dorsal, p. 419.
    b. Root of the ventral opposite to the middle of the dorsal, p. 420.
  B. Species from the Indian Ocean and Archipelago. China.
    a. Root of the ventral opposite to the origin of the dorsal, p. 423.
    b. Root of the ventral opposite to the middle of the dorsal.
      aa. The height of the body is one-third or more of the total length (without caudal), p. 423.
      bb. The height of the body is less than one-third of the total length (without caudal), p. 425.
    c. Root of the ventral opposite to the posterior half of the dorsal, p. 430.
  C. Australian species, p. 431.

III. No teeth, or on the tongue only.
    1. The last dorsal ray prolonged into a filament (*Opisthonema*), p. 432.
    2. The last dorsal ray not prolonged (*Alosa*).
      A. Atlantic species, p. 433.
      B. Pacific species, p. 443.

C. Indian species.
  a. L. lat. 80, p. 444.
  b. L. lat. less than 50.
    aa. Teeth none, p. 445.
    bb. Teeth on the tongue, p. 449.

I. *A conspicuous ovate patch of minute teeth on the vomer* (Clupea).

1. Clupea harengus.

The Herring. Der Häring. Le Hareng. Sill (*Swed.*).

Harengus, *Rondel. De Pisc.* p. 222; *Gesner, De Aquat.* p. 408; *Willughby, Hist. Pisc.* p. 219, tab. P. 1. fig. 2.

Clupea, sp., *Artedi, Synon.* p. 14 (synon. pars), no. 1; *Genera,* p. 7. no. 1; and *Spec.* p. 31. no. 1; *Gronov. Zoophyl.* no. 348.

Sild, *Ström, Söndm.* p. 307.

Harengus, *Klein, Pisc. Miss.* v. p. 71. no. 1, tab. 19. fig. 2.

Herring, *Pennant, Brit. Zool.* iii. p. 294, pl. 68. no. 160, or, edit. 1812, iii. p. 444, pl. 79; *Couch, Fish. Brit. Isl.* iv. p. 95, pl. 202.

Le Hareng, *Duhamel, Pêches,* iii. p. 335.

Clupea harengus, *L. Syst. Nat.* i. p. 522; *Bloch, Fische Deutschl.* p. 235, pl. 29. fig. 1; *Bl. Schn.* p. 422; *Lacép.* v. p. 427; *Olav. Isländ. Reise,* p. 82; *Faber, Fische. Isl.* p. 182; *Pallas, Zoogr. Ross.-As.* iii. p. 209; *Turton, Brit. Faun.* p. 106; *Fleming, Brit. An.* p. 182; *Brandt & Ratzeburg, Med. Zool.* ii. p. 40, tab. 7. fig. 1; *Jenyns, Man.* p. 434; *Yarrell, Brit. Fish.* 2nd edit. ii. p. 183, or 3rd edit. i. p. 98; *Parnell, Werner. Mem.* vii. p. 315, tab. 35; or *Fish. Firth of Forth,* p. 155, tab. 35; *Kröyer, Danm. Fisk.* iii. p. 139; *Cuv. & Val.* xx. pp. 30–242, pls. 591, 592 (intest.), 593 (skeleton, bad); *Nilss. Skand. Faun. Fisk.* p. 491; *Gronov. Syst.* ed. *Gray,* p. 139; *Münter, Wiegm. Arch.* 1863, p. 281; *Malmgren, Wiegm. Arch.* 1864, p. 341; and *Œfvers. Svensk. Vet. Akad. Förhandl.* 1865, p. 535.

Clupea harengus membras, *L. Fauna Suec.* p. 128; *Pallas, Zoogr. Ross.-As.* iii. p. 211; *Ekström, Fische v. Mörkö,* p. 207; *Malmgren, Wiegm. Arch.* 1864, p. 341; or *Finland's Fisk-fauna,* p. 67.

—— pallasii, *Cuv. & Val.* xx. p. 253.

? Clupea lineolata, *Cuv. & Val.* xx. p. 256.

Variety.

Clupea leachii, *Yarrell, Zoolog. Journ.* v. p. 278, pl. 12; and in *Proc. Zool. Soc.* 1831, p. 34; and in *Brit. Fish.* 2nd edit. ii. p. 193, or 3rd edit. i. p. 111; *Cuv. & Val.* xx. p. 243; *Couch, Fish. Brit. Isl.* iv. p. 107.

Separate works on the Herring.

Neucrantz, P. De Harengo. Exercitatio medica. Lübeck, 1654.

Dodd, J. S. Essay towards a Natural History of Herring. Lond. 1768, 8vo.

James Sola's Essay towards a Natural History of Herrings.

Bock, Versuch einer vollständigen Natur- und Handel-Geschichte des Herings. Königsberg, 1769, 8vo.

Mitchell, J. M. The Herring; its Natural History and national importance. Edinb. 1864, 8vo, pp. 372, with illustrations.

Young.

Whitebait.

White-bait, *Pennant, Brit. Zool.* iii. p. 371, pl. 69. no. 176, or edit. 1812, iii. p. 465, pl. 80; *Couch, Fish. Brit. Isl.* iv. p. 114, pl. 203 (bad).

Cyprinus esca, *Walb. Artedi,* iii. p. 36; *Bl. Schn.* p. 446.

Clupea latulus, *Cuv. Règne Anim.*

—— alba, *Yarrell, in Zool. Journ.* iv. pp. 137, 465, pl. 5. fig. 2; *Brit. Fish.* 2nd edit. ii. p. 202, or 3rd edit. i. p. 121; *Jenyns, Man.* p. 436; *Parnell, Werner. Mem.* vii. p. 325, tab. 35; or *Fish. Firth of Forth,* p. 165, tab. 35.

Rogenia (!) alba, *Cuv. & Val.* xx. p. 341, pl. 598.

Synonymy for American specimens.

Clupea harengus, *Fabric. Faun. Grœnland.* p. 182; *Mitch. Amer. Month. Mag.* ii. p. 323; *Richards. Franklin's Journal,* p. 716, and *Faun. Bor.-Amer.* iii. p. 229.

—— elongata, *Lesueur, Journ. Acad. Nat. Sc. Philad.* i. p. 234; *Storer. Report Fish. Mass.* p. 111; *Dekay, New York Fauna, Fish.* p. 250; *Cuv. & Val.* xx. p. 247; *Storer, Mem. Am. Ac.* vi. p. 330, pl. 26. fig. 1.

? Clupea minima, (*Peck*) *Storer, l. c.* p. 113; *Cuv. & Val.* xx. pl. 259 (? young).

B. 8. D. 17–20. A. 16–18. V. 9. L. lat. 53–59.
Cæc. pylor. 18–23. Vert. 56.

The height of the body is nearly equal to the length of the head. Lower jaw prominent; the maxillary extending nearly to below the middle of the eye. An elongate ovate patch of very small teeth on the tongue and vomer; palatine teeth, if present, minute. Gill-rakers fine, closely set, about as long as the eye. Ventral fins inserted below the middle of the dorsal fin. There are thirteen abdominal scutes behind the ventrals. Operculum without radiating striæ. No dark spot on the shoulder.

North Atlantic; northern coasts of Asia.

The teeth on the palatine bones, like those of the jaws, are minute and rudimental, and frequently entirely absent, especially in old examples; so that their presence or absence is not a character fit for specific, and much less for generic, distinction, as has been already observed by Nilsson, Skand. Faun. Fisk. p. 489. As regards the "Whitebait," this is a purely nominal species, introduced into science by Yarrell and Valenciennes in deference to the opinion of fishermen and gourmands. The pterygoid teeth on which the genus *Rogenia* (!) was founded, are so minute, that I could find them in two examples only; and even there it was doubtful whether the asperities were real teeth. All the examples of Whitebait I have examined were young herrings.

European examples.

a. Adult. Thames. Presented by W. B. Tegetmeier, Esq. Caught in December.

b. Five inches long. Thames; February. Presented by G. Busk, Esq. "*Whitebait.*"

c. Numerous examples, 2½ and 6 inches long. Thames; April. Presented by Dr. Baird. "*Whitebait.*"

d–g. One and a half to two and three inches long. Thames; July. From Yarrell's Collection. "*Clupea alba.*"

h. Four and a half inches long. Thames; October. From Yarrell's Collection. "*Clupea alba.*"

i, k, l. Numerous young examples. Thames. "*Whitebait.*"

m–p. Two to three inches long. River Exe; May 31st, 1863. Presented by W. S. M. D'Urban, Esq.

q–t. Three inches long. River Exe; June 1862. Presented by W. S. M. D'Urban, Esq.

u. Four and a half inches long. River Exe; June 8th, 1863. Presented by W. S. M. D'Urban, Esq.

v. Several examples, 2½–3 inches long. River Exe; August 13th, 1862. Presented by W. S. M. D'Urban, Esq.

w. Several examples, 3–4 inches long. River Exe. Presented by J. Salter, Esq. "*Whitebait.*"

x–y. Three and a half to five inches long. South Devon. From G. Montague's Collection.

z. Five inches long. Medway. From the Haslar Collection.

α–β. Seven inches long. Presented by Mr. E. Gerrard. Sold in the London market as *Pilchards.*

γ–ε. Adult: skins. Frith of Forth. Purchased of Mr. Parnell.

ζ. Four and a half inches long. Frith of Forth; March. From Mr. Parnell's Collection. "*Clupea alba.*"

η. Four and a half inches long. Frith of Forth; April. From Mr. Parnell's Collection. "*Clupea alba.*"

θ, ι, κ. Three inches and four and a half inches long. Frith of Forth; April. From Mr. Parnell's Collection. "*Clupea harengus.*"

λ. Two inches and two-thirds long. Frith of Forth; July. From Mr. Parnell's Collection. "*Clupea sprattus.*"

μ. Two inches and two-thirds long. Frith of Forth; July. From Mr. Parnell's Collection. "*Clupea alba.*"

ν. Two inches long. Frith of Forth; August. From Mr. Parnell's Collection. "*Clupea alba.*"

ξ. Fry, 1¼ inch long. Frith of Forth; August. From Mr. Parnell's Collection. "*Clupea harengus.*"

ο, π, ρ, ς. Two to three inches long. Frith of Forth. From Mr. Parnell's Collection. "*Clupea harengus.*"

τ–χ. Two inches long. Frith of Forth. From Mr. Parnell's Collection. "*Clupea alba.*"

ψ, ω, a′, b′. Three or three and a half inches long. Scotland. From Mr. Parnell's Collection.

c′–d′. Four inches long. Presented by Dr. Johnston.

e′. Fine female specimen. Holland. Purchased of Mr. Damon.

f′–g′. Adult: skins. Holland. From Gronow's Collection.

h′. Adult. Baltic. From the Haslar Collection.

i′–l′. Half-grown: bad state. Finland. "*Clupea ignota.*"

m′–n′. Large specimens, 15 inches long. Old Collection.

o′. Fine adult specimen.

American examples.

a. Adult. Boston. Presented by B. Winstone, Esq. "*Clupea elongata.*"
b. Several examples, 4–5 inches long. East Boston. Presented by B. Winstone, Esq. "*Clupea minima.*"
c. Adult: in not good state. Halifax, Nova Scotia. Presented by J. Mathew Jones, Esq., F.L.S.

2. Clupea mirabilis.

Girard, Proc. Ac. Nat. Sc. Philad. 1854, p. 138; *U. S. & Pac. R. R. Exped. Fish.* p. 329.

B. 8. D. 19. A. 15. L. lat. 49. Cæc. pyl. 18. Vert. 51.

This fish differs scarcely from the Herring of the Atlantic; it appears to have a ray less in the anal fin; also the number of vertebræ is smaller.

California.

a–d. Adult. San Francisco. Presented by Dr. W. O. Ayres.
e–f. Skins Vancouver Island. Collected by Mr. J. K. Lord.
g. Skeleton: adult female. San Francisco. Presented by Dr. W. O. Ayres.

3. Clupea pontica.

Clupea piltschardus, *Pall. Zoogr. Ross.-As.* iii. p. 204.
—— pontica, *Eichwald, Bull. Soc. Nat. Mosc.* 1838, p. 135; and *Faun. Casp.-Caucas.* p. 162, tab. 32. fig. 2; *Nordmann, in Demid. Voy. Russ. Mérid.* iii. p. 520, pl. 25. fig. 2; *Cuv. & Val.* xx. p. 244.

Closely allied to *Cl. harengus.*

B. 8. D. 15–17. A. 20–21.

The height of the body is nearly equal to the length of the head, which is one-fourth of the total (without caudal). Lower jaw rather prominent, the maxillary extending to, or somewhat behind. the posterior margin of the orbit. Small teeth on the tongue, vomer, and palatine bones. Ventral fins inserted behind the vertical from the anterior dorsal rays. Operculum striated. A dark spot on the scapulary region.

Black Sea.

4. Clupea caspia.

Eichwald, Bull. Soc. Nat. Mosc. 1838, p. 134; and *Faun. Casp.-Caucas.* p. 161, tab. 32. fig. 1.

D. 13. A. 18.

Scales of moderate size. The height of the body is one-third of the total length (without caudal), the length of the head two-sevenths. Small teeth on the vomer and palatine bones, none on the tongue. Lower jaw received in a notch of the upper; maxillary extending to below, or somewhat behind, the posterior margin of the orbit. Ventrals inserted a little behind the origin of the dorsal fin.

A series of four or more blackish spots along the side of the back of the trunk. Base of the pectoral fins deep black. (*Eichw.*)

Caspian Sea.

This species appears to be intermediate between the Herrings and Shads.

II. *Minute teeth on the palate, none on the vomer.*

A. *Atlantic species.*

a. *Root of the ventral opposite to the origin of the dorsal.*

5. Clupea sprattus.

The Sprat or Garvie. Der Breitling. L'esprot. Skarpsill or Hvassbuk (*Swed.*).
Sprattus, *Willughby, Hist. Pisc.* p. 221.
Clupea quadriuncialis &c., *Artedi, Synon.* p. 17; *Genera*, p. 7; *Species*, p. 33.
Brisling, *Ström, Söndmör*, i. p. 281.
Clupea sprattus, *L. Syst. Nat.* i. p. 523; *Faun. Suec.* p. 128; *Bloch, Fische Deutschl.* i. p. 206, tab. 29. fig. 2 (bad); *Bl. Schn.* p. 423; *Lacép.* v. p. 444; *Nilss. Prodr.* p. 22; and *Skand. Faun. Fisk.* p. 516; *Turt. Brit. Faun.* p. 107; *Jenyns, Manual*, p. 435; *Yarrell, Brit. Fish.* 2nd edit. ii. p. 197, or 3rd edit. i. p. 115 (figure not good); *Parnell, Werner. Mem.* vii. p. 322, tab. 35; or *Fish. Firth of Forth*, p. 162, tab. 35; *Gaimard, Voy. Scand. Poiss.* pl. 18. fig. 2; *Kröyer, Danm. Fisk.* iii. p. 177; *Malmgren, Wiegm. Arch.* 1864, p. 341; or *Finlands Fisk-fauna*, p. 68.
Sprat, *Pennant, Brit. Zool.* iii. p. 303, or, edit. 1812, iii. p. 457; *Couch, Fish. Brit. Isl.* iv. p. 199, pl. 203 (not good).
Clupea macrocephala, *Swainson, Lardner Cycl. Fish.* ii. p. 387.
—— schoneveldii, *Kröyer, Danm. Fisk.* v. p. 193; *Gaimard, Voy. Scand. & Lap.* pl. 18.
Harengula sprattus, *Cuv. & Val.* xx. p. 285.
Spratella pumila, *Cuv. & Val.* xx. p. 357, pl. 600 (this plate is numbered 603 in our edition, and named *Meletta vulgaris*).
Meletta vulgaris, *Cuv. & Val.* xx. p. 366, description, but not pl. 603.

Note.—Although Valenciennes's account of the European Clupeoids has the appearance of great accuracy of detail, and of an exact distinction of the species, a longer acquaintance with his ichthyological labours shows that, towards the end of his great work, he worked mechanically after a fixed, artificial plan, altogether losing sight of the natural affinities of the objects which he described. Thus only can be explained the confused state in which he left this species. A comparison of a small number of Sprats is convincing that the presence or absence of rudimentary palatine teeth cannot form a distinctive generic or specific character. The confusion is augmented by the erroneous names and numbers on the plates. First of all the plate representing *Rogenia alba* is erroneously numbered 601 instead of 598. Then there are two plates representing different fishes, both named "*Meletta vulgaris*," and both numbered "603;" whilst there is no plate for "*Spratella pumila*," which is stated in the letterpress to be figured on pl. 600. Therefore we may presume that one of the plates numbered 603 ought to be referred to *Spratella pumila*; and indeed, "Les écailles fort petites" et "la dorsale reculée sur la seconde moitié du tronc," attributed to *Spratella pumila*, are characters which are fairly represented in one of those figures.

But, then, the other figure, which may be presumed to be intended for *Meletta vulgaris*, does not agree with the description. Valenciennes has made the latter from a Sprat without palatine teeth, as is quite evident from his remarks on the position of the ventrals, the number of fin-rays and vertebræ, &c. Thus it remains to be shown for what species the latter figure is intended. If it is taken from a European example, the nearest approach to it is *Clupea madeirensis* of Lowe; but without having the example from which the figure was drawn it is almost impossible to determine this question with certainty.

B. 6–7. D. 15–18. A. 17–20. V. 7. L. lat. 47–48.
Vert. 47–49.

Scales deciduous, smooth. The height of the body is equal to, or nearly equal to, the length of the head. Lower jaw prominent, the maxillary extending to somewhat beyond the vertical from the front margin of the eye. An elongate ovate patch of very small teeth on the tongue, none on the vomer. Gill-rakers very fine, closely set, rather shorter than the eye. Ventral fins even with the origin of the dorsal. There are eleven or twelve abdominal scutes behind the root of the ventrals. Operculum without radiating striæ.

Atlantic coasts of Europe.

a. Several adult examples. London market. Presented by Mr. E. Gerrard.
b, c, d, e, f, g. Adult, half-grown, and young. Firth of Forth. Purchased of Mr. Parnell.
h–i. Adult. "Found in an arable field in Ross-shire, April 21st, 1828." Presented by Th. Allen, Esq.
k. Adult. Presented by Dr. Johnston.
l. Adult. From the Haslar Collection.

b. *Root of the ventral opposite to the middle of the dorsal.*

6. **Clupea aurita.**

? Clupea harengus, *Brünn. Pisc. Mass.* p. 81.
?? Clupanodon phalerica, *Risso, Eur. Mérid.* iii. p. 452.
Sardinella aurita, *Cuv. & Val.* xx. p. 263, pl. 594.

B. 6. D. 20. A. 15. V. 9. L. lat. 52.

Scales smooth, scarcely striated. The length of the head is nearly equal to the height of the body, and two-ninths of the total (without caudal). Lower jaw slightly projecting beyond the upper; the maxillary extending nearly to below the middle of the eye. A very small patch of minute teeth anteriorly on the palatine bones; small teeth on the tongue; none on the vomer. Suboperculum obtusely rounded behind. Origin of the dorsal fin much nearer to the end of the snout than to the root of the caudal; ventral fins inserted below the middle of the dorsal. *A black spot superiorly in the gill-opening.* (*Val.*)

Mediterranean.

7. Clupea anchovia.

Sardinella anchovia, *Cuv. & Val.* xx. p. 269.

D. 16. A. 16.

This fish is said to be nearly identical with *Cl. aurita*, from which it would differ, beside in the number of fin-rays, in having the suborbital bones finely venulose.

Atlantic coasts of Tropical America.

8. Clupea granigera.

Sardinella granigera, *Cuv. & Val.* xx. p. 267.

D. 18. A. 21.

Scales rather large, striated, with granular margin. The length of the head is rather less than the height of the body, which is one-fifth of the total (with the caudal). A very small patch of minute teeth anteriorly on the palatine bones; small teeth on the tongue; none on the vomer. Coloration uniform. No spot on the shoulder. (*Val.*)

Coast of Egypt.

9. Clupea macrophthalma.

Clupea macrophthalma, *Ranzani, Nov. Co . Ac. Sc. Inst. Bonon.* v. 1842, p. 320, tab. 23.
Harengula sardina, *Poey, Mem. Cub.* ii. p. 310.

D. 17–18. A. 17–18. V. 8. L. lat. 38–42. L. transv. 12.
Vert. 40.

The length of the head is contained thrice and a half in the total (without caudal), the height of the body thrice or thrice and a third. Scales regularly arranged, firm, adherent, those on the back with very indistinct radiating striæ, *the others being crossed by four to seven vertical lines.* Lower jaw prominent, the maxillary extending beyond the front margin of the orbit. Teeth distinct in the jaws, on the palatine and pterygoid bones, and on the tongue; *they form ovate patches.* Cheeks and opercles with venules. Gill-rakers very fine and closely set, shorter than the eye; gill-cavity blackish. Eye large, as long as the snout, which is of moderate extent, one-third of the length of the head. Ventral fin inserted below the middle of the dorsal fin, the base of which is more distant from the end of the snout than from the root of the caudal fin. There are twelve abdominal scutes behind the base of the ventral fin. Silvery, back with some dark longitudinal streaks. An indistinct small dark spot on the scapula.

West Indies.

a, b–c. Adult. Cuba. From the Collection of the Zoological Society.
d–h. Fine specimens. St. Croix. Purchased of Mr. Stevens.
i–k. Adult: skins. Jamaica. Purchased of Mr. Parnell.
l. Adult. Barbadoes. Purchased of M. Ehrhardt.
m–n. Adult. From the Haslar Collection.

10. Clupea humeralis.

Duhamel, Pêches, iii. pl. 31. figs. 2 & 4.
Harengula clupeola, *Cuv. & Val.* xx. p. 289.
—— maculosa, *Cuv. & Val.* xx. p. 292.
—— humeralis, *Cuv. & Val.* xx. p. 293.

B. 6. D. 16–18. A. 17–18. V. 8. L. lat. 42. L. transv. 11.

The length of the head is contained thrice and two-thirds or thrice and three-fourths in the total (without caudal), the height of the body from twice and three-fourths to thrice and a half. Scales regularly arranged, firm, adherent, those on the back distinctly serrated, the lateral being smooth. Lower jaw prominent, *the maxillary extending beyond the front margin of the orbit.* Teeth distinct in the jaws, on the palatine and pterygoid bones, and on the tongue; *they form ovate patches.* Cheeks and opercles with venules. Gill-rakers very fine and closely set, shorter than the eye; gill-cavity blackish. Eye large, longer than the snout, which is short and obtuse, one-third of the length of the head. Ventral fin inserted below the middle of the dorsal fin, which occupies nearly the middle of the distance between the end of the snout and the root of the caudal fin. There are fourteen abdominal scutes behind the base of the ventral fin. Silvery, back with some darker greenish longitudinal streaks. A dark spot superiorly in the gill-opening.

Atlantic coasts of Tropical America.

a–b. Fine specimens. Bahia. From Dr. Wucherer's Collection.
c. Numerous skins. Jamaica. Purchased of Mr. Parnell.
d–f Adult and half-grown. San Domingo. Purchased of Mr. Cuming.
g. Large specimen. Trinidad. Purchased of Mr. Cutter. (174.)
h–k. Adult. Dominica. Purchased of Mr. Cutter.
l–o. Half-grown. Gulf of Mexico. From the Haslar Collection.
p–r. Adult. Barbadoes. Purchased of Mr. Cutter. (35.)
s, t. Numerous specimens. West Indies.
u–w. Adult. From the Haslar Collection.

11. Clupea latula.

La Blanquette.
Harengula latulus, *Cuv. & Val.* xx. p. 280, pl. 595.

B. 6. D. 17. A. 19. V. 8. L. lat. 43. Vert. 44.

Scales firm, adherent, smooth. The length of the head equals the height of the body, and is contained thrice and two-thirds in the total (without caudal). Lower jaw scarcely projecting beyond the upper; maxillary extending to below the middle of the eye (?). Small teeth on the palatine bones and on the tongue; none on the vomer. Suboperculum small and narrow. Base of the dorsal fin occupying the middle of the distance of the snout from the caudal; ventral fins below the middle of the dorsal. Shining silvery. (*Val.*)

Atlantic coasts of France.

This fish may prove to be identical with *Cl. humeralis.*

B. *Species from the Indian Ocean and Archipelago. China.*

a. *Root of the ventral opposite to the origin of the dorsal.*

12. Clupea argyrotænia.

Alausa champil, *Cant. Mal. Fish.* p. 302 (not *Gray*).
Rogenia argyrotænia, *Bleek. Verh. Bat. Gen.* xxiv. *Haring*, p. 26; or *Nat. Tydschr. Ned. Ind.* iii. p. 457.

B. 6. D. 16. A. 17–18. L. lat. 41. L. transv. 10.

The length of the head is one-fourth of the total (without caudal), the height of the body one-third; head nearly as deep as long. Scales regularly arranged, firm, adherent, smooth, with the margin entire. Abdominal profile more convex than dorsal. Lower jaw scarcely projecting beyond the upper; snout short, maxillary extending beyond the vertical from the front margin of the orbit. A narrow strip of minute and deciduous teeth on the palatine and pterygoid bones (? similar teeth on the vomer*); tongue with a median longitudinal toothed ridge. Opercles smooth. Gill-rakers very fine and closely set, shorter than the eye. Eye as long as the snout, two-sevenths of the length of the head. *Ventral fin inserted below the origin of the dorsal fin*, which is rather nearer to the end of the snout than to the root of the caudal fin. There are eleven abdominal scutes behind the base of the ventral fin. Suboperculum rounded behind. Body with a silvery longitudinal band.

Java; Banka; Pinang.

a. Adult. Java. From Dr. Bleeker's Collection.
b. Adult: skin. Pinang. From Dr. Cantor's Collection.

b. *Root of the ventral opposite to the middle of the dorsal.*

aa. *The height of the body is one-third or more of the total length (without caudal).*

13. Clupea brachysoma.

Sardinella brachysoma, *Bleek. Verh. Bat. Gen.* xxiv. *Haring*, p. 19.

B. 6. D. 17–18. A. 18–19. L. lat. 45. L. transv. 13.

The length of the head is contained four times and one-fifth in the total (without caudal), the height of the body twice and three-fourths; head nearly as deep as long. Scales regularly arranged, firm, adherent, *with the margin conspicuously serrated and irregularly crenulated.* Abdominal profile conspicuously more convex than the dorsal. Lower jaw scarcely projecting beyond the upper; snout short, *maxillary extending to below the front margin of the orbit.* A narrow strip of teeth on the palatine and pterygoid bones; none on the vomer; tongue with a median longitudinal crest, which bears only rudimental teeth, if any. Cheeks and operculum with very fine radiating striæ. Gill-rakers very fine and closely set, shorter than the eye. Eye as long as the snout, two-sevenths of the length of the head. Ventral fin inserted below the middle of the dorsal fin, which occupies nearly the middle of the distance between the end of the snout and the root of the caudal fin. There are fourteen abdominal scutes behind the base of the ventral fin. Caudal fin scaly. A brownish spot on the shoulder (sometimes very indistinct); a blackish spot anteriorly on the base of the dorsal fin.

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* I am unable to find them.

Java.

a. Type of the species. Batavia. From Dr. Bleeker's Collection.
b. Half-grown. Java. Purchased.

14. Clupea perforata.

Clupeonia perforata, *Cant. Mal. Fish.* p. 294.
Spratella kowala, *Bleek. Ver. Bat. Gen.* xxiv. *Haring*, p. 28; or *Nat. Tydschr. Ned. Ind.* ii. p. 492 (not *Clupea kowal*, Rüpp).

D. 19. A. 19. L. lat. 43. L. transv. 13.

The length of the head is one-fourth of the total (without caudal), the height of the body one-third; head nearly as deep as long. Scales regularly arranged, firm, adherent, *with the margin slightly serrated and irregularly crenulated*. Abdominal profile more convex than dorsal. Lower jaw slightly projecting beyond the upper; snout short, maxillary extending beyond the vertical from the front margin of orbit. A narrow strip of teeth on the palatine bones; none on the the vomer and pterygoids; tongue with a median longitudinal toothed ridge. Opercles smooth. Gill-rakers very fine and closely set, shorter than the eye. Eye as long as the snout, two-sevenths of the length of the head. Ventral fin inserted below the middle of the dorsal fin, which occupies the middle of the distance between the end of the snout and the root of the caudal fin. There are thirteen abdominal scutes behind the base of the ventral fin. Caudal fin scaly. Back bluish with dark longitudinal lines; sides silvery; top of the dorsal fin and a spot at the base of the anterior rays blackish.

East-Indian archipelago.

a. Type of the species. Pinang. From Dr. Cantor's Collection.
b. Type of *Sp. kowala*. From Dr. Bleeker's Collection.
c, *d*. Fine specimens. Amboyna. Purchased of Mr. Frank.

15. Clupea albella.

Kowala albella, *Cuv. & Val.* xx. p. 362, pl. 602.

B. 6. D. 19. A. 23.

The height of the body is one-third of the total length (without caudal), the length of the head one-fourth. Small teeth on the pterygoids and jaws only. Maxillary extending beyond the vertical from the front margin of the eye. Ventral fins below the middle of the dorsal. Coloration uniform. (*Val.*)

Pondicherry.

bb. *The height of the body is less than one-third of the total length (without caudal).*

16. Clupea sirm.

Clupea sirm, *Forsk. Descr. Anim.* p. xvii. no. 144; *Rüpp. N. W. Fische*, p. 77, taf. 21. fig. 1 (not good).
Sardinella leiogaster, *Cuv. & Val.* xx. p. 270; *Bleek. Verh. Bat. Gen.* xxiv. *Haring*, p. 18.
? Harengula punctata, *Cuv. & Val.* xx. p. 297. (See p. 412.)
Sardinella leiogastroides, *Bleek. Tydschr. Ned. Ind.* vii. p. 255 (young).

B. 6. D. 17–18. A. 18–19. L. lat. 40. L. transv. 12.

The height of the body is less than the length of the head, which is contained four times and one-fourth in the total (without caudal). Scales regularly arranged, thin, deciduous, without striæ or serrature. Jaws equal in length, the maxillary not quite extending to below the front margin of the orbit. Patches of minute teeth on the palatine and pterygoid bones and on the base of the tongue; none on the vomer. Cheeks with venules, opercles smooth. Gill-rakers rather shorter than the eye, fine, and closely set; there are about thirty-five on the lower branch of the first branchial arch. Eye of moderate size, shorter than the snout, one-fourth of the length of the head. Ventral fins inserted below the middle of the dorsal fin, the origin of which is nearer to the end of the snout than to the root of the caudal fin. There are fourteen abdominal scutes behind the ventral fin; they do not project. Sometimes a series of round bluish spots along the side.

Red Sea; Indian ocean and archipelago.

a. Adult: skin. Zanzibar. From Col. Playfair's Collection.
b. Adult. Batavia. From Dr. Bleeker's Collection.
c. Young, type of *S. leiogastroides*. Manado. From Dr. Bleeker's Collection.

17. Clupea clupeoides.

Amblygaster clupeoides, *Bleek. Journ. Ind. Archipel*, 1849, p. 73.
Sardinella clupeoides, *Bleek. Verh. Bat. Gen.* xxiv. *Haring*, p. 19; or *Tydschr. Ned. Ind.* iii. p. 773.

B. 6. D. 17. A. 16–17. L. lat. 43*. L. transv. 12.

The height of the body equals the length of the head, which is contained four times and one-third in the total (without caudal). Scales regularly arranged, thin, rather adherent, without striæ or serrature. Jaws equal in length, *the maxillary not extending to* below the front margin of the orbit. Broad patches of distinct teeth on the palatine and pterygoid bones and on the tongue; none on the vomer, and apparently none in the jaws. Cheeks with venules, opercles smooth. Gill-rakers much shorter than the eye, rather coarse; there are about thirty on the lower branch of the first branchial arch. Eye large, somewhat shorter than the snout, two-sevenths of the length of the head. Ventral fin inserted below the anterior half of the dorsal fin, the origin of which is midway between the end of the snout and the root of the caudal fin. There are fourteen abdominal scutes behind the ventral fin. Coloration uniform.

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* Not 35 p. m., as stated by Bleeker.

Macassar; Batavia.

a. Adult. Java. From Dr. Bleeker's Collection.

18. Clupea tembang.

Spratella fimbriata, *Bleek. Verh. Bat. Gen.* xxiv. *Haring*, p. 27 (not *C. & V.*).
Clupea gibbosa, *Bleek. Journ. Ind. Archip.* 1849, *Celebes.*
Spratella tembang, *Bleek. Verh. Bat. Gen.* xxiv. *Haring*, p. 28; or *Nat. Tydschr. Ned. Ind.* iii. p. 774.

B. 6. D. 18. A. 18–19. L. lat. 45. L. transv. 12.

The height of the body is a little more than the length of the head, which is one-fourth of the total (without caudal). Head longer than deep. Scales regularly arranged, rather firm, and adherent, with the margin very indistinctly striated. Abdominal and dorsal profiles nearly equally convex. Lower jaw projecting beyond the upper; snout of moderate length, maxillary not extending to below the middle of the orbit. A narrow strip of minute and deciduous teeth on the palatine bones; none on the vomer; tongue with a very narrow median band of minute teeth. Cheeks with very fine radiating striæ; opercles smooth. Gill-rakers fine and closely set, shorter than the eye. Eye shorter than the snout; a little more than one-fourth of the length of the head. Ventral fin inserted below the middle of the dorsal fin, the origin of which is considerably nearer to the end of the snout than to the root of the caudal fin. There are fourteen abdominal scutes behind the base of the ventral fin. Back bluish, with dark longitudinal lines; sides silvery.

East-Indian archipelago.

a. Type of *Sp. tembang*. From Dr. Bleeker's Collection.
b. Adult. From Dr. Bleeker's Collection as *Sp. fimbriata*.
c. Half-grown. Java. Purchased.

19. Clupea atricauda.

? Clupanodon jussieui, var., *Lacép.* v. pl. 11. fig 3
? Clupeonia commersonii, *Cuv. & Val.* xx. p. 350.
? —— vittata, *Cuv. & Val.* xx. p. 352.
Harengula melanurus, *Bleek. Nat. Tydschr. Ned. Ind.* v. p. 245 (*not* Alausa melanurus, *C. & V.*).

B. 6. D. 18. A. 18. L. lat. 44. L. transv. 12.

The height of the body equals the length of the head, which is one-fourth of the total (without caudal); head longer than deep. Scales regularly arranged, rather firm, and adherent, with the margin indistinctly serrated and irregularly crenulated. Abdominal profile not more convex than the dorsal. Lower jaw projecting beyond the upper; snout of moderate length, maxillary not extending to below the middle of the orbit. A narrow strip of minute and deciduous teeth on the palatine and pterygoid bones; none on the vomer; tongue with a very narrow median band of minute teeth. Cheeks with very fine radiating striæ; opercles smooth. Gill-rakers fine and closely set, shorter than the eye. Eye shorter than the snout; one-fourth of the length of the head. Ventral fin inserted below the middle of the dorsal fin, the origin of which is considerably nearer to the end of the snout than to the root of the caudal fin. There are thirteen abdominal scutes behind the base of the ventral fin. A dark streak along each dorsal series of scales; *tip of each caudal lobe deep black* (this disappears occasionally in preserved examples).

Ceram and Amboyna.

a. Type of the species. Ceram. From Dr. Bleeker's Collection.
b–d. Fine specimens. Amboyna. Purchased of Mr. Frank.

This fish does not appear to be distinct from *Clupea tembang*.

20. Clupea moluccensis.

Harengula moluccensis, *Bleek. Nat. Tydschr. Ned. Ind.* iv. p. 609.
—— kunzei, *Bleek. l. c.* xii. p. 209.

B. 6. D. 17–18. A. 17. L. lat. 40. L. transv. 12.

The height of the body equals the length of the head, which is a little more than one-fourth of the total (without caudal); head longer than deep. Scales regularly arranged, rather firm, deciduous, with the margin slightly and irregularly crenulated. Abdominal profile not more convex than the dorsal. Lower jaw projecting beyond the upper; snout short, maxillary extending nearly to below the middle of the orbit. A narrow strip of teeth on the palatine and pterygoid bones; none on the vomer; tongue with a median band of minute teeth. Cheeks and operculum with very fine radiating striæ. Gill-rakers fine and closely set, shorter than the eye; there are about thirty-eight on the lower branch of the outer branchial arch. Eye as long as the snout, two-sevenths of the length of the head. Ventral fin inserted below the middle of the dorsal fin, the origin of which is not much nearer to the end of the snout than to the root of the caudal fin. There are thirteen abdominal scutes behind the base of the ventral fin. Coloration uniform.

Molucca Sea; Ceylon.

a. Type of the species. From Dr. Bleeker's Collection.
b. Type of *H. kunzei*. Ternate. From Dr. Bleeker's Collection.
c. Adult. Ceylon. Presented by Sir J. E. Tennent.

21. Clupea fimbriata.

Spratella fimbriata, *Cuv. & Val.* xx. p. 359, pl. 600; *Day, Fish. Malab.* p. 233.
Kowala lauta, *Cant. Mal. Fish.* p. 270.

D. 18–19. A. 16–19. L. lat. 45. L. transv. 12.

The length of the head is contained four times in the total (without caudal), the height of the body thrice and a fourth. Scales regularly arranged, firm, adherent, *with the margin striated, serrated, or deeply indented.* Lower jaw scarcely prominent, the maxillary extending beyond the front margin of the orbit. An ovate patch of minute teeth on the palatine bones; these teeth are sometimes deciduous; none on the pterygoid bones. A narrow strip along the median ridge of the tongue. Opercles smooth. Gill-rakers very fine and closely set, scarcely shorter than the eye. Eye as long as the snout, which is of moderate extent, rather more than one-fourth of the length of the head. Ventral fin inserted below the middle of the dorsal fin, the base of which is midway between the end of the snout and the root of the caudal fin. There are fourteen abdominal scutes behind the base of the ventral fin. Back greenish; sides silvery.

Indian Ocean.

a–b. Types of the species, skins. Pinang. From Dr. Cantor's Collection.

c. Adult. Madras. Purchased of Surgeon Day.

22. **Clupea longiceps.**

Sardinella longiceps, *Cuv. & Val.* xx. p. 273.

D. 16. A. 16.

The height of the body is less than the length of the head, which is one-third of the total (without caudal). Teeth on the palatine and pterygoid bones and on the tongue. (*Val.*)

Pondicherry.

23. **Clupea nymphæa.**

Clupea nymphæa, *Richards. Ichthyol. Chin.* p. 304.

D. 17. A. 20. L. lat. 40. L. transv. 13.

The length of the head is contained four times in the total (without caudal), the height of the body thrice and one-sixth; head nearly as deep as long. Scales regularly arranged, firm, adherent, conspicuously striated, with the margin serrated and irregularly crenulated. Abdominal profile more convex than dorsal. Lower jaw scarcely projecting beyond the upper; snout short, maxillary extending beyond the vertical from the front margin of the orbit. A narrow strip of minute teeth on the pterygoid bones; none on the vomer: tongue with a median longitudinal toothed ridge. Opercles smooth; gill-rakers very fine and closely set, shorter than the eye. Eye as long as the snout, two-sevenths of the length of the head. Ventral fin inserted below the middle of the dorsal fin, which occupies the middle of the distance between the end of the snout and the root of the caudal fin. There are twelve abdominal scutes behind the base of the ventral fin. Suboperculum subtruncate behind.

China.

a. Five and a half inches long. Presented by J. R. Reeves, Esq.

Richardson (*l. c.*), apparently guided by two drawings presented by Mr. Reeves to the British Museum, described two Chinese Herrings under the names *Clupea isingleena* and *Clupea nymphæa*. Although these drawings are not sufficiently exact to serve for a satisfactory diagnosis of these fishes, yet the one named *Cl. isingleena* is much deeper in the body than the other, which has become the type of *Cl. nymphæa*. Richardson states that a specimen of each exists in the British Museum, from which he has completed his descriptions, saying that the specimen of *Cl. isingleena* has twenty-one anal rays, and is 5½ inches long; whilst *Cl. nymphæa* is said to have fifteen or sixteen anal rays only; the size is not stated. —I cannot help coming to the conclusion that Richardson (who, having made his observations in the British Museum, afterwards worked out these materials at his own home) fell into an error with regard to these species. There is only one example in the British Museum; and this belongs, on account of its oblong form, to the figure named *Cl. nymphæa*, although it has twenty anal rays and is 5½ inches long; notes taken from it have evidently been transferred by Richardson to *Cl. isingleena*, to which it cannot be referred on account of its more slender form.

What *Cl. isingleena* is, can hardly be made out; it may be *Cl. kowala*, or one of the species allied to it.

24. Clupea dispilonotus.

Harengula dispilonotus, *Bleek. Nat. Tydschr. Ned. Ind.* iii. p. 456; or *Verh. Bat. Gen.* xxiv. *Haring*, p. 49.

B. 6. D. 18. A. 15. L. lat. 32. L. transv. 11.

The length of the head is contained four times in the total (without caudal), the height of the body thrice and one-third; head a little longer than deep. Scales regularly arranged, rather firm and deciduous, with the margin entire, and with several vertical striæ. Abdominal profile more convex than the dorsal; lower jaw scarcely projecting beyond the upper; snout short; maxillary extending beyond the front margin of the orbit. A band of teeth on the palatine and pterygoid bones, none on the vomer; tongue with a broad patch of minute teeth. Cheeks and operculum with very fine radiating striæ. Gill-rakers very fine and closely set, shorter than the eye. Eye a little shorter than the snout, one-third of the length of the head. Ventral fin inserted below the middle of the dorsal fin, which occupies nearly the middle of the distance between the end of the snout and the root of the caudal fin. There are thirteen abdominal scutes behind the base of the ventral fin. *Two black spots on the back*—one on the base of the posterior dorsal rays, and the other at some distance behind it.

Banka.

a. Type of the species. Banka. From Dr. Bleeker's Collection.
b–f. Adult. From the Haslar Collection.

25. Clupea jussieui.

Clupanodon jussieui, *Lacép.* v. pp. 471 & 474, pl. 11. fig. 2.
Clupeonia jussieui, *Cuv. & Val.* xx. p. 346, pl. 599.

B. 6. D. 20. A. 20. L. lat. 45.

The length of the head is nearly one-sixth (according to the figure one-fifth) of the total length (with the caudal), the height of the body two-ninths. Teeth absent on the vomer and palatine bones, but a small group on the pterygoids, and a narrow longitudinal band on the tongue. *Operculum covered with numerous, fine, radiating striæ.* Ventral fins nearly opposite to the middle of the dorsal. Free portion of the scales smooth. (*Val.*)

Mauritius.

c. *Root of the ventral opposite to the posterior half of the dorsal.*

26. Clupea melanosticta.

Clupea melanosticta, *Schleg. Faun. Japon. Poiss.* p. 237, pl. 107. fig. 3 (*not* Alosa melanosticta, *Cuv. & Val.*).
—— cæruleo-vittata, *Richards. Ichthyol. Chin.* p. 305.

B. 6. D. 17–18. A. 16–17. L. lat. 45. L. transv. 13.

The height of the body is less than *the length of the head, which is contained thrice and three-fifths in the total* (without caudal). Scales regularly arranged, thin, deciduous, with the margin entire. Lower jaw rather projecting beyond the upper; the maxillary extending beyond the front margin of the orbit. Bands of minute teeth on the palatine and pterygoid bones, and on the tongue; none on the vomer. Cheeks with venules; opercles smooth. Gill-rakers a little shorter than the eye, very fine, and closely set. Eye of moderate size, shorter than the snout, two-ninths of the length of the head. Ventral fin inserted below the posterior half of the dorsal fin, the base of which occupies the middle of the distance between the end of the snout and the root of the caudal fin. There are thirteen abdominal scutes behind the ventral fin. Sometimes a series of round bluish spots along the middle of the side.

China and Japan.

a–b. Adult. China. Presented by J. R. Reeves, Esq.
c. Young. China.

27. Clupea lemuru.

Sardinella lemuru, *Bleek. Nat. Tydschr. Ned. Ind.* iv. p. 500.

B. 6. D. 17–18. A. 13–15. L. lat. 47. L. transv. 13.

The height of the body is less than the length of the head, which is one-fourth of the total (without caudal). Scales regularly arranged, thin, rather adherent, *with the margin crenulated.* Lower jaw rather projecting beyond the upper; *the maxillary extending beyond the front margin of the orbit.* Narrow bands of minute teeth on the palatine and pterygoid bones, and on the base of the tongue; none on the vomer. Cheeks with venules; opercles smooth. Gill-rakers rather shorter than the eye, very fine, and closely set. Eye of moderate size, shorter than the snout, one-fourth or two-ninths of the length of the head. Ventral fin inserted below the posterior half of the dorsal fin, the base of which occupies the middle of the distance between the end of the snout and the root of the caudal fin. There are fourteen abdominal scutes behind the ventral fin. Coloration uniform, a small brownish spot behind the operculum (disappearing in preserved examples).

Java.

a. Type of the species. Batavia. From Dr. Bleeker's Collection.

28. Clupea hypselosoma.

Harengula hypselosoma, *Bleek. Nat. Tydschr. Ned. Ind.* viii. 1855, p. 427.

D. 18. A. 20. L. lat. 44. L. transv. 12.

The length of the head is contained four times and one-fourth in the total (without caudal), the height of the body twice and three-fourths; head nearly as deep as long. Scales regularly arranged, firm, adherent, with the margin serrated and irregularly crenulated. Abdominal and dorsal profiles equally convex. Lower jaw slightly projecting beyond the upper; snout short, *maxillary extending nearly to below the middle of the orbit.* A narrow strip of teeth on the palatine and pterygoid bones, none on the vomer; tongue with a median longitudinal toothed ridge. Opercles smooth. Gill-rakers very fine and closely set, a little shorter than the eye. Eye as long as the snout, contained thrice and one-third in the length of the head. Ventral fin inserted below the posterior half of the dorsal fin, which occupies the middle of the distance between the end of the snout and the root of the caudal fin. There are thirteen abdominal scutes behind the base of the ventral fin. Top of the dorsal fin, a spot on the base of the anterior dorsal rays, and extremity of the caudal lobes blackish.

Amboyna.

a. Type of the species. From Dr. Bleeker's Collection.

C. *Australian species.*

29. Clupea novæ hollandiæ.

Meletta novæ hollandiæ, *Cuv. & Val.* xx. p. 376.

B. 8. D. 16. A. 16. L. lat. 48. L. transv. 11. Cæc. pyl. 14. Vert. 47.

The length of the head is contained four times and one-third in the total (without caudal), the height of the body four times. Scales regularly arranged, firm, adherent, smooth. Lower jaw rather prominent, the maxillary narrow, extending a little beyond the front margin of the orbit. A small patch of distinct teeth anteriorly on the palatine bones; none on the pterygoid bones. A series of teeth along the median ridge of the tongue. Opercles smooth; *suboper-*

culum narrow, tapering behind. Gill-rakers fine and closely set, half as long as the eye. Eye as long as the snout, which is of moderate extent, two-sevenths of the length of the head. Ventral fin inserted below the anterior half of the dorsal fin, the origin of which is nearer to the end of the snout than to the root of the caudal fin. There are fifteen abdominal scutes behind the base of the ventral fin, their spines much projecting. Silvery, dorsal and caudal fins brownish.

Eastern Australia.

a–d. Fine specimens. New South Wales. From Mr. Rayner's Collection.
e, f, g–h. Adult. Hawkesbury River. From Mr. Krefft's Collection.
i. Adult: skeleton. New South Wales. From Mr. Rayner's Collection.

III. *No teeth, or on the tongue only.*

1. *The last dorsal ray prolonged into a filament* (Opisthonema).

30. Clupea thrissa.

The Sprat, *Brown, Jamaica*, p. 443.
Cailleu-Tassart, *Duhamel, Pêches*, iii. pl. 31. fig. 3.
Clupea trissa, *Osbeck, Reise*, p. 336; *Brousson. Ichth.* fasc. i.; *Bonnaterre, Encycl. Ichth.* p. 186, pl. 76. fig. 315; *Bloch*, xii. p. 35, taf. 404; *Bl. Schn.* p. 424.
Megalops thrissoides, *Agass. in Spix, Pisc. Bras.* p. 45, pl. 22.
—— oglina, *Lesueur, Journ. Ac. Nat. Sc. Philad.* i. p. 359.
—— notata, *Lesueur, l. c.* p. 361.
Chatoëssus signifer, *Dekay, N. York Faun. Fish.* p. 264, pl. 41. fig. 132.
Meletta thrissa, *Cuv. & Val.* xx. p. 380.
? Chatoëssus eumorphus, *Gosse, Nat. Soj. Jam.* p. 290.
Opisthonema thrissa, *Gill, Proc. Ac. Nat. Sc. Philad.* 1861, p. 37.

B. 6. D. 19. A. 23–24. V. 8. L. lat. 50. L. transv. 16. Vert. 48.

The last dorsal ray produced into a long filament. The height of the body is one-third of the total length (without caudal), the length of the head rather less than one-fourth. Lower jaw but slightly prominent; the maxillary extending somewhat beyond the vertical from the front margin of the eye. No teeth on the palate; tongue generally with a very narrow strip of minute teeth. Operculum entirely smooth. Gill-rakers very fine, nearly as long as the eye, closely set. Ventral fin inserted below, or nearly below, the middle of the base of the dorsal. Origin of the dorsal fin considerably nearer to the end of the snout than to the root of the caudal. There are fourteen abdominal scutes behind the base of the ventral fins. Length of the pectoral fin three-fifths of the distance of its root from the ventral fin. Scales regularly arranged, nearly smooth, the striæ being exceedingly fine. An indistinct bluish spot on the shoulder. Each scale on the back with a dark spot, the spots forming longitudinal series.

Atlantic coasts of America.

a. Adult. Barbadoes. Purchased of Mr. Cutter.

b. Fine specimen. Dominicia. Purchased of Mr. Cutter.
c–d. Young. Puerto Cabello. Purchased of Mr. Brandt.
e. Adult. Trinidad. Purchased of Mr. Cutter.
f. Adult. Granada. Purchased of Mr. Cutter.
g. Fine specimen. San Domingo. Purchased of Mr. Cuming.
h. Adult. Cuba. From the Collection of the Zoological Society.
i–o. Adult: skins. Jamaica. Purchased of Mr. Parnell.
p, q, r–u. Adult. West Indies.
v. Adult: skeleton. Barbadoes. Purchased of Mr. Cutter.

On an accessory branchial organ and the intestines see Hyrtl, Denkschr. Ak. Wiss. Wien, 1855, x. pp. 48 & 51.

31. **Clupea libertatis.**

Meletta libertatis, *Günth. Proc. Zool. Soc.* 1866, p. 603.

Very similar to *Clupea thrissa.*

D. 17. A. 19. L. lat. 48.

The last dorsal ray is produced into a long filament. The height of the body is a little more than the length of the head, which is contained thrice and two-thirds in the total (without caudal). Structure of head, fins, and scales as in *Cl. thrissa.* No humeral spot.

Pacific coast of Central America.

a. Type of the species, 2½ inches long. Libertad. From Mr. Salvin's Collection.

2. *The last dorsal ray not prolonged* (Alosa).

A. *Atlantic species.*

32. **Clupea alosa.**

The Shad. The Allis or Allice Shad. Der Mai-Fisch or Die Alse.
Alausa, *Auson.* v. *v.* 127; *Bellon. De Aquat.* p. 309; *Salvian.* fol. 104.
Trichis, *Bellon. De Aquat.* p. 306.
Thrissa, *Rondel.* p. 220.
Allis, *Penn. Brit. Zool.* iii. p. 307.
Clupea, sp., *Gronov. Zoophyl.* no. 347.
Clupea alosa (part.), *L. Syst. Nat.* i. p. 523.
Harengus, sp., *Klein, Pisc. Miss.* v. p. 72. no 5, t. 19. f. 4.
Clupea rufa, *Lacép.* v. p. 452.
Clupea alosa, *Cuv. Règne An.*; *Jenyns, Man.* p. 438; *Gronov. Syst.* ed. *Gray,* p. 139; *Günth. Fische d. Neckars,* p. 121.
Alosa communis, *Yarrell, Brit. Fish.* 2nd edit. ii. p. 213, or 3rd edit. i. p. 133; *Parnell, Werner. Mem.* vii. p. 330; or *Fish. Firth of Forth,* p. 170.
Alausa vulgaris (part.), *Cuv. & Val.* xx. p. 391; *Heckel & Kner, Süsswasserf.* p. 228. fig. 133.
Alosa vulgaris, *Troschel, Wiegm. Arch.* 1852, p. 228; *Sélys-Longch. Faun. Belge,* p. 220; *Siebold, Süsswasserfische,* p. 328.
Allis Shad, *Couch, Fish. Brit. Isl.* p. 117, pl. 204.
Skeleton: *Agassiz, Poiss. Foss.* v. 2. p. 111, pl. 1.

Remarks on the Synonymy of Clupea alosa *and* Clupea finta.

Although several authors, especially Cuvier, distinguished these two species, they were not properly defined until Troschel pointed out the difference of the shape and structure of the gill-rakers. The two species being in every other respect so extremely similar, the apparently greater number of spots in *A. finta* is the only guide by which we can determine whether the description of an author refers to this or to the other species. However, as these spots generally disappear in preserved examples, and, on the other hand, some authors evidently mention their presence only because their predecessors mentioned them, this character cannot be relied upon in determining the synonyms. Besides, many authors considered the two fishes to be identical. Thus, although I have endeavoured to arrange the synonymy for each species, some of the references may be erroneously placed, which, however, is of but slight importance.

As we now know that there are two species of Shad, which have been named *alosa* and *finta*, it is a question whether these names have been applied according to the rules of nomenclature.

Artedi, who has given the first scientific description, had evidently the species with thick gill-rakers, as he says "apophyses in parte concava osseæ, albæ et *satis robustæ*." Linné, who has done little more in ichthyology than giving binominal terms to Artedi's species, named this fish *Clupea alosa*. Both authors confounded the two species in their synonymy; but as zoologists regard the specimen actually examined by an author as the type of the species established by him, the specific name *alosa* ought to be retained for the species with thick gill-rakers.

The second name, *finta*, introduced by Cuvier, refers to the species known in some provinces of France by the vernacular name "La Feinte," which, again, is the fish with thick gill-rakers.

Consequently *finta* and *alosa* are synonymous, and the species with thin gill-rakers has no specific name (if the genus *Alosa* is not adopted).

Troschel followed Cuvier's nomenclature; and I also think that in this instance the rules of nomenclature should not be too strictly adhered to. The name Alosa is evidently derived from the German Alse (English Allis), which applies principally to the common species, with thin gill-rakers, the one more particularly esteemed as food; and for this reason it would be very inconvenient to transfer it to the "Feinte."

B. 8. D. 19–21. A. 21–24. V. 9. L. lat. 70.

The height of the body is more than the length of the head, which is one-fourth or two-ninths of the total (without caudal). Lower jaw but slightly prominent; maxillary extending to, or nearly to, the vertical from the hind margin of the orbit. No teeth on the palate or the tongue. *Gill-rakers very fine and long, from sixty to eighty on the horizontal part of the outer branchial arch.* Ventral fins inserted behind the origin of the dorsal, which is nearer to the end of the snout than to the root of the caudal. Basal half of the caudal fin covered with small scales. There are from fifteen to sixteen abdominal scutes behind the base of the ventral fins. Operculum with irregular radiating striæ, descending towards the suboperculum. A large blackish blotch in the scapulary region, sometimes followed by a series of smaller similar blotches.

Coasts of Europe.

a. Fine large specimen. Neckar. From the Stuttgart Collection.
b–c. Half-grown and young: skins. Holland. From Gronow's Collection.
d. Adult: stuffed. England.
e. Half-grown. Polperro.
f–g. Half-grown. Lisbon. Presented by the Rev. R. T. Lowe.

33. Clupea finta.

The Shad, Twaite-Shad. La Feinte. Stak-sill (Sweden)
Agonus, *Bellon. De Aquat.* p. 304; *Salvian.* fol. 105 *b* & 106.
Shad, *Willughby, Hist. Pisc.* p. 227, tab. P. 3. fig. 1; *Pennant, Brit. Zool.* iii. p. 305, pl. 69, or, ed. 1812, iii. p. 460, pl. 80; *Yarrell, in Zool. Journ.* iv. pp. 137 & 465, pl. 5. fig. 1.
Clupea, sp. (part.), *Artedi, Synon.* p. 15. no. 2; *Genera*, p. 7. no. 3.
Clupea, no. 3, *Artedi, Spec.* p. 34.
Clupea alosa, *L. Syst. Nat.* i. p. 523 (part.); *Bl. Fische Deutschl.* i. p. 209, tab. 30. fig. 1; *Bl. Schn.* p. 423; *Lacép.* v. p. 447; *Risso, Ichth. Nice*, p. 353; and *Eur. Mérid.* iii. p. 453; *Donovan, Brit. Fish.* iii. pl. 57, and pl. 98 (young; this is not the "Whitebait"); *Turton, Brit. Faun.* p. 106; *Fleming, Brit. An.* p. 183.
Alose, *Duham. Pêches*, iii. p. 316.
Clupea fallax, *Lacép.* v. p. 452.
Clupea finta, *Cuv. Règne Anim.*; *Jenyns, Man.* p. 437.
Alosa finta, *Yarrell, Brit. Fish.* 2nd edit. ii. p. 208, or 3rd edit. i. p. 127; *Parnell, Werner. Mem.* vii. p. 329; or *Fish. Firth of Forth*, p. 169; *Kröyer, Danm. Fisk.* iii. p. 202; *Nilss. Skand. Faun. Fisk.* p. 527; *Troschel, Wiegm. Arch.* 1852, p. 228; *Sélys-Longch. Faune Belge*, p. 220; *Martens, Wiegm. Arch.* 1857, p. 182; *Siebold, Süsswasserfische*, p. 332.
Alausa vulgaris (part.), *Cuv. & Val.* xx. p. 391.
Twait-Shad, *Couch, Fish. Brit. Isl.* p. 122, pl. 205.

B. 8. D. 18–20. A. 20–24. V. 9. L. lat. 60–75. Vert. 56.

The height of the body is more than the length of the head, which is one-fourth or two-ninths of the total (without caudal). Lower jaw but slightly prominent; maxillary extending to, or nearly to, the vertical from the hind margin of the orbit. No teeth on the palate or the tongue. Gill-rakers stout, osseous, from 21 to 27 on the horizontal part of the outer branchial arch. Ventral fins inserted behind the origin of the dorsal, which is nearer to the end of the snout than to the root of the caudal. Basal half of the caudal fin covered with small scales. There are from fifteen to sixteen abdominal scutes behind the base of the ventral fins. Operculum with irregular radiating striæ descending towards the suboperculum. A large, blackish blotch in the scapulary region, sometimes followed by a series of 4–6 similar blotches.

Coasts of Europe, entering rivers. Nile.

a. Young. Thames. Presented by J. G. Children, Esq.

b. Young. Thames. Presented by W. Yarrell as *Clupea alosa*.
b'. Adult. Polperro. Purchased.
c–d. Adult: stuffed. England.
e–f. Young. Lisbon. Presented by the Rev. R. T. Lowe.
g. Half-grown: skin. Lago Maggiore. Presented by T. C. Eyton, Esq.
h. Half-grown. River Ricka (Montenegro). From the Milan Museum.
i–k. Adult. Propontis. Purchased of Dr. Millingen.
l–m. Half-grown. Nile. Presented by the Rev. O. P. Cambridge
n. Adult.
o. Adult: skeleton. Propontis. Purchased of Dr. Millingen.

Hybrids.

There is a very singular example in the British Museum, which, as regards the development of the gill-rakers, is perfectly intermediate between *Clupea alosa* and *C. finta*; they are forty in number, not very closely set, and longer than those of *C. finta*, but shorter than those of *C. alosa*. They are longer than the eye. There is no other character which would indicate that this is a distinct species: D. 21. A. 25. L. lat. 68. L. transv. 22. I believe that this is a hybrid between the two species mentioned.

a. Nineteen inches long. Old Collection.

By the kindness of Mr. Couch I have been enabled to examine the typical example (or rather the remains) of his *Alosa squamopinnata* (Fish. Brit. Isl. iv. p. 123, pl. 206). This is evidently a *hybrid* between *Cl. pilchardus* and *Cl. finta* or *alosa*. It has the large scales of the former, and the ventral fins placed as in the latter; unfortunately the gill-rakers are not preserved, so that I cannot decide whether the other parent was *C. finta* or *alosa*.

a. Skin, in very bad state. Cornwall. Presented by J. Couch, Esq.

34. **Clupea menhaden.**

Mossbanker.
Clupea menhaden, *Mitch. Lit. & Phil. Trans. New York*, i. p. 453, pl. 5. fig. 7.
Alosa menhaden, *Storer, Report Fish. Massach.* p. 117; *Dekay, N. York Faun. Fish.* p. 259, pl. 21. fig. 60; *Ayres, Bost. Journ. Nat. Hist.* iv. p. 275; *Cuv. & Val.* xx. p. 424; *Storer, Mem. Am. Ac.* vi. p. 337, pl. 26. fig. 3.
—— sadina, *Dekay, l. c.* p. 263, pl. 40. fig. 129.—Mitchell's *Clupea sadina* (Trans. Lit. & Phil. Soc. New York, i. p. 457) was evidently a different fish, which, however, cannot be determined at present.
Clupea carolinensis, *Gronov. Syst.* ed. *Gray*, p. 140.
Brevoortia menhaden, *Gill, Proc. Ac. Nat. Sc. Philad.* 1861, p. 37 (name only).

D. 19. A. 19–20. V. 7.

Scales irregularly arranged; their free portion is very narrow and deep, with the margin ciliated. *The height of the body is rather less* *than the length of the head, which is one-third of the total (without caudal).* Lower jaw shutting within the upper; maxillary reaching to the vertical from the hind margin of the orbit. No teeth on the palate or tongue. Operculum finely striated; suboperculum large, tapering above. Gill-rakers very fine and exceedingly long; the horizontal branch of the outer branchial arch consists of two portions joined at an obtuse angle. Ventral fins opposite to the anterior third of the dorsal, the origin of which is somewhat nearer to the caudal than to the end of the snout. Basal half of the caudal fin covered with small scales. There are from twelve to thirteen abdominal scutes behind the base of the ventral fins. A blackish blotch in the scapulary region.

Atlantic coasts of the United States.

a, b. Adult. New York. Purchased of Mr. Brandt.
c–d. Half-grown and young: skins. New York. From Mr. Parnell's Collection.
e–f. Young. North America. Presented by E. Doubleday, Esq.
g. Young. Old Collection (*Clupea smaragdina*).
h. Young: skin. From Gronow's Collection.—Type of *Clupea carolinensis*.

35. **Clupea aurea.**

Clupanodon aureus, *Agass. in Spix, Pisc. Bras.* p. 52, tab. 21.
Alausa aurea, *Cuv. & Val.* xx. p. 427.

B. 7. D. 20. A. 22.

Scales irregularly arranged; their free portion is very narrow and deep, with the margin ciliated. The height of the body is rather more than the length of the head, which is contained thrice and one-fourth in the total (without caudal). Lower jaw shutting within the upper; maxillary nearly reaching to the vertical from the middle of the orbit. No teeth on the palate or tongue. Operculum finely striated; suboperculum large, tapering above. Gill-rakers very fine and exceedingly long; the horizontal branch of the outer branchial arch consists of two portions joined at an obtuse angle. Ventral fins opposite to the anterior rays of the dorsal, the origin of which is a little nearer to the end of the snout than to the root of the caudal. Basal half of the caudal fin covered with small scales. There are twelve abdominal scutes behind the base of the ventral fins. A blackish blotch in the scapulary region.

Coast of Brazil.

a. Old Collection, as *Clupea smaragdina*.

An accessory branchial organ in a rudimental condition has been noticed by Hyrtl, Denkschr. Ak. Wiss. Wien, x. 1855, p. 49.

36. **Clupea pectinata.**

Alosa pectinata, *Jenyns, Zool. Beagle, Fish.* p. 135, pl. 25.

D. 16. A. 21. L. lat. 46. L. transv. 21.

Scales rather irregularly arranged, with striæ, and with the margin strongly serrated. The height of the body is more than the length of the head, which is one-third of the total length (without caudal). Lower jaw shutting within the upper; maxillary reaching to below, or somewhat beyond, the middle of the eye. No teeth on the palate or tongue. *Operculum striated in its lower portion, suboperculum narrow, subvertical, tapering above.* Ventral fins opposite to the anterior half of the dorsal. A dark spot on the shoulder.

East coast of South America.

a. One of the typical specimens, stuffed. North Patagonia. Presented by C. Darwin, Esq.

37. **Clupea dorsalis.**

Alausa dorsalis, *Cuv. & Val.* xx. p. 418.
Alosa platycephalus, *Bleek. Verh. Holl. Maatsch. Haarlem*, 1862, *Guinée*, p. 123, pl. 26. fig. 2.

B. 7. D. 15–17. A. 19–22. L. lat. 45. L. transv. 18.

Scales regularly arranged, *with numerous striæ, and with the margin ciliated.* The height of the body is a little more than the length of the head, which is one-third of the total length (without caudal), or in young examples sometimes a little less than one-third. Lower jaw shutting within the upper; maxillary reaching to below the middle of the eye. No teeth on the palate or tongue. *Operculum smooth; suboperculum large, of moderate width, tapering above, obliquely directed backwards.* Gill-rakers very fine and long, and exceedingly numerous; the horizontal branch of the outer branchial arch consists of two portions joined at an obtuse angle. Ventral fins opposite to the anterior half of the dorsal. There are eleven abdominal scutes behind the ventral fins. An indistinct bluish spot in the scapulary region.

West Africa.

a. Eleven inches long; has been in chloride of zinc. Niger Expedition.
b, c, d–f. Young. Rivers of West Africa.

38. **Clupea mattowocca.**

Gaspereau.
Clupea mattowocca, *Mitch. Trans. Lit. & Phil. Soc. New York*, i p. 451, pl. 5. fig. 8.
—— mediocris, *Mitch. l. c.*
? Clupea parvula, *Mitch. l. c.* p. 452.
? —— fasciata, *Lesueur, Journ. Ac. Nat. Sc. Philad.* i. p. 233.
? —— virescens, *Dekay, New York Faun. Fish.* p. 252, pl. 13. fig. 37.
Alosa mattowocca, *Dekay, New York Faun. Fish.* p. 260, pl. 11. fig. 127; *Ayres, Bost. Journ. Nat. Hist.* iv. p. 275.
—— tyrannus, *Dekay, New York Faun. Fish.* p. 258, pl. 13. fig. 38; *Gilpin, Proc. & Trans. N. Scot. Inst. Nat. Sc. Halifax*, ii. p 107.
Meletta matowacca, *Cuv. & Val.* xx. p. 371.
Alosa lineata, *Storer, Proc. Bost. Soc. Nat. Hist.* ii. p. 242; and *Mem. Amer. Ac.* vi. p. 340, pl. 27. fig. 2.
Pomolobus mediocris, *Gill, Canad. Nat.* 1865 (name only).

D. 17. A. 19. V. 9. L. lat. 50. L. transv. 17.

Scales regularly arranged. The height of the body is one-third of the total length (without caudal), the length of the head one-fourth. Lower jaw slightly projecting beyond the upper; maxillary not reaching to the vertical from the hind margin of the orbit. No teeth on the palate, tongue without, or with very small, deciduous teeth. Operculum coarsely and irregularly striated. Gill-rakers fine and long; the horizontal branch of the outer branchial arch is but slightly bent, and bears about 42 gill-rakers. Ventral fins opposite to the anterior half of the dorsal, the origin of which is nearer to the end of the snout than to the root of the caudal. Basal half of the caudal fin covered with small scales. There are fourteen abdominal scutes behind the base of the ventral fins. A blackish blotch in the scapulary region. A series of punctulated dots along each dorsal series of scales.

Atlantic coasts of North America.

a–b. Adult. Halifax, N. Sc. Presented by J. Mathew Jones, Esq., F.L.S.

c. Adult; has been in chloride of zinc. Boston. Presented by B. Winstone, Esq.

d. Young: skin, not in good state. New York. Purchased of Mr. Parnell.

Unfortunately, not having specimens, we are unable to decide whether *Meletta venosa* of Valenciennes is really a species distinct from *Cl. mattowocca*; it would appear to differ in having the operculum entirely smooth; its synonymy appears to be as follows:—

Meletta venosa, *Cuv. & Val.* xx. p. 374.
Alosa cyanonoton, *Storer, Proc. Bost. Soc. Nat. Hist.* ii. p. 242; and *Mem. Am. Acad.* vi. p. 339, pl. 27. fig. 1.
—— tyrannus, *Storer, Mem. Amer. Acad.* vi. p. 334, pl. 26. fig. 3
Alausella parvula, *Gill, Proc. Ac. Nat. Sc. Philad.* 1861, p. 36.
Pomolobus pseudo-harengus, "*Gill ex Wilson.*"

39. Clupea pilchardus.

The Pilchard. Der Pilchard. La Sardine or le Céléren or le Célan.
Sardina, *Bellon.* p. 161; *Rondel.* pp. 217, 218; *Gesner*, p. 822; *Cornide, Peces d. Galic.* p. 91.
Harengus minor s. Pilchardus, *Willughby, Hist. Pisc.* p. 223, tab. P. 1. fig. 1.
Pilchard, *Penn. Brit. Zool.* iii. p. 300, pl. 68, or, edit. 1812, iii. p. 453; *Couch, Fish. Brit. Isl.* iv. p. 79, pl. 201.
Clupea sprattus, *Brünnich, Pisc. Massil.* p. 82; *Risso, Ichth. Nice*, p. 352.
Clupea pilchardus, *Walb. Arted.* iii. p. 38; *Bl. Ausl. Fische*, ix. p. 40, pl. 406; *Bl. Schn.* p. 452; *Cuv. Règne Anim.*; *Donov. Brit. Fish.* iii. pl. 69; *Turton, Brit. Faun.* p. 106; *Fleming, Brit. An.* p. 183; *Jenyns, Manual*, p. 437; *Yarrell, Brit. Fish.* 2nd edit. ii. p. 169, or 3rd edit. i. p. 137; *Parnell, Werner. Mem.* vii. p. 320; or *Fish. Firth of Forth*, p. 160.
Sardine, *Duhamel, Pêches*, ii. pl. 16. fig. 4.
Clupea sardina, *Cuv. Règne Anim.*; *Lowe, Trans. Zool. Soc.* ii. p. 189.
Clupanodon sardina, *Risso, Eur. Mérid.* p. 451.

Clupanodon pilchardus, *Risso, l. c.*
Alausa pilchardus, *Cuv. & Val.* xx. p. 445, pl. 605.

B. 6. D. 17–18. A. 19–21. V. 6. L. lat. 47–48. Vert. 53 (50–51, *Lowe*). Cæc. pyl. 7.

The height of the body is nearly equal to the length of the head, which is one-fourth of the total (without caudal). Lower jaw but slightly prominent; the maxillary extending somewhat beyond the vertical from the front margin of the eye. No teeth on the palate or on the tongue. Gill-rakers very fine and long, closely set. Ventral fins inserted below, or nearly below, the middle of the base of the dorsal. Origin of the dorsal fin considerably nearer to the end of the snout than to the root of the caudal. There are from twelve to fourteen abdominal scutes behind the base of the ventral fins. Operculum with very conspicuous radiating striæ descending towards the suboperculum. A small blackish spot in the scapulary region.

Mediterranean and neighbouring parts of the Atlantic; extending northwards to the coasts of England and Sweden. (See *Clupea sagax*, p. 443.)

Var. *α. sardina.*

Base of the ventral fin below the middle of the base of the dorsal. Gill-rakers a little shorter than the eye.

a. Fine specimen. Dalmatia.
b. Half-grown. Nice. Purchased of Dr. Deakin.
c, d–e. Fine specimens. Madeira. Presented by the Rev. R. T. Lowe.
f–g. Half-grown. From the Haslar Collection.

Var. *β. pilchardus.*

Base of the ventral fin behind the middle of the base of the dorsal. Gill-rakers a little longer than the eye.

a. Adult. Cornwall. Presented by T. Priestley, Esq.
b. Adult: stuffed. Cornwall.
c–e. Adult.

40. **Clupea maderensis.**

Arengue.
Clupea maderensis, *Lowe, Trans. Zool. Soc.* ii. p. 189.
? Harengula forsteri, *Cuv. & Val.* xx. p. 299.
Alausa eba, *Cuv. & Val.* xx. p. 417.
Meletta mediterranea, *Cuv. & Val.* xx. p. 369.

B. 6. D. 18–19. A. 18–19. V. 8. L. lat. 45–50. L. transv. 11–13. Vert. 47.

The height of the body is nearly equal to the length of the head, which is one-fourth of the total (without caudal). Lower jaw but slightly prominent; the maxillary extending somewhat beyond the vertical from the front margin of the eye. No teeth on the palate; tongue without or with a very narrow strip of minute teeth. Operculum entirely smooth. Gill-rakers very fine and long, closely set. Gill-cavity black. Ventral fin inserted below, or nearly below, the middle of the base of the dorsal. Origin of the dorsal fin considerably nearer to the end of the snout than to the root of the caudal. There are fourteen or fifteen abdominal scutes behind the base of the ventral fins. Length of the pectoral fin two-thirds of the distance of its root from the ventral fin. Scales finely striated, with the margin more or less regularly rounded, sometimes lacerated. A dark line along the four upper series of scales. Scapula with a very obsolete dark spot; extremities of the caudal lobes blackish. A blackish spot at the base of the anterior dorsal rays.

Mediterranean; Madeira; Cape de Verde Islands; Azores; West coast of Africa.

a–c. Half-grown. Mediterranean. From Mr. Petherick's Collection.
d–e. Types of the species. Madeira. From the Collection of the Zoological Society.
f. Very fine specimen. Madeira. Presented by J. Y. Johnson, Esq.
g. Adult. Lanzarote. Presented by the Rev. R. T. Lowe.
h–i, k–m. Adult and half-grown. Cape de Verde Islands. Presented by the Rev. R. T. Lowe.
n, o. Adult. Niger Expedition.

Perhaps only a variety of *Cl. senegalensis.*

41. Clupea senegalensis.

Alosa senegalensis, *Benn. Proc. Comm. Zool. Soc.* i. 1831, p. 147.
Meletta senegalensis, *Cuv. & Val.* xx. p. 370.

B. 6. D. 18. A. 21. V. 8. L. lat. 54. L. transv. 14.

The height of the body is one-third of the total (without caudal), the length of the head one-fourth. Lower jaw but slightly prominent; the maxillary extending somewhat beyond the vertical from the front margin of the eye. No teeth on the palate; tongue with a very narrow strip of minute teeth. Operculum smooth. Gill-rakers very fine and long, rather shorter than the eye, closely set. Gill-cavity black. Ventral fin inserted below, or nearly below, the middle of the base of the dorsal. Origin of the dorsal fin considerably nearer to the end of the snout than to the root of the caudal. There are fourteen abdominal scutes behind the base of the ventral fins. Length of the pectoral fin three-fourths of the distance of its root from the ventral fin. Scales finely striated, with the margin ciliated and lacerated. Scapula with a very obsolete dark spot. A black spot at the base of the anterior dorsal rays. Inner side of pectoral and lobes of caudal blackish.

West coast of Africa.

a–b. Ten inches long. Camaroons. Presented by Dr. J. A. Smith.

42. Clupea apicalis.

Alosa apicalis, *Müll. & Trosch. in Schomburgk, Hist. Barbad.* p. 675.

D. 18. A. 17.

The lower jaw surpasses the upper in length, the maxillary reaches to the first third of the eye; and the diameter of that organ is larger than half the size of the head. The scales are large, forming nine rows on each side of the body; they are silvery, and each scale is marked on the belly with a copper-coloured spot. The point of the snout above and beneath is black; on the front there is a small black longitudinal band, and over each eye a black spot. The point of the dorsal fin, and the posterior edge of the forked caudal fin are black; the ventrals are attached under the middle of the dorsal fin. (*M. & Tr.*)

Barbadoes.

Alosa bishopi, Müll. & Trosch. *l. c.*, is mentioned in the following terms:—This species agrees in some points with the former; it has, however, a black spot behind the operculum, which is not to be observed in the *A. apicalis*, and the dorsal fin is without the black mark. It possesses, likewise, like *Alosa tyrannus* of Dekay, the indistinct dark longitudinal lines; but the eye of the Barbadoes species is larger, its diameter being equal to half the height of the head. There are eleven rows of scales on each side of the body; the ventrals are fixed under the middle of the dorsal fin; the caudal fin is forked. Length 4½ inches.

43. **Clupea pseudohispanica.**

Sardinia pseudohispanica, *Poey, Mem. Cub.* ii. p. 311.

D. 18. A. 17. Vert. 46.

Scales deciduous, entire, with vertical striæ. The height of the body is one-fifth of the total length (with the caudal), the length of the head two-ninths. The diameter of the eye is one-third of the length of the head. *The maxillary extends to below the middle of the orbit.* Cheek and opercles venulose. Minute teeth on the tongue and the symphysis of the mandible, none on the palate. The distance of the dorsal fin from the end of the snout is contained twice and five-sixths in the total length; ventral fin below the middle of the dorsal. (*Poey.*)

Cuba.

44. **Clupea arcuata.**

Jenyns, Voy. Beagle, Fish. p. 134.

D. 18. A. 23. L. lat. 42.

The length of the head is contained four times and one-fourth in the total (without caudal), the height of the body thrice; head nearly as deep as long. Scales regularly arranged, deciduous. Abdominal profile more convex than dorsal. Lower jaw projecting beyond the upper; snout short, maxillary extending beyond the vertical from the front margin of the orbit. A narrow strip of minute teeth on the tongue, none on the palate. Opercles smooth Gill-rakers very fine and closely set, nearly as long as the eye. Eye as long as the snout, two-sevenths of the length of the head. *Ventral inserted below the origin of the dorsal fin, which is rather nearer to the root of the caudal than to the end of the snout.* There are ten abdominal scutes behind the base of the ventral fin.

North Patagonia.

This description is taken from the typical specimens in the Museum of the University of Cambridge.

B. *Pacific species.*

45. Clupea maculata.

Alausa maculata, *Cuv. & Val.* xx. p. 430; *Gay, Chile, Zool.* ii. p. 322; *Ictiol. lam.* 10. fig. 2 (not good).

B. 9. D. 20. A. 17. L. lat. 50.

Scales rather irregularly arranged, with numerous striæ, and with the margin pectinated. The height of the body is nearly equal to the length of the head, which is one-third of the total length (without caudal). Lower jaw shutting within the upper; maxillary reaching to behind the eye. No teeth on the palate or tongue. Operculum nearly smooth, suboperculum of moderate width, tapering above, obliquely directed upwards. Gill-rakers very fine and long, and exceedingly numerous; the horizontal branch of the outer branchial arch straight. Origin of the dorsal fin nearer to the end of the snout than to the root of the caudal. Upper half greenish, lower silvery, with irregular series of blackish spots.

Chile; Peru

a. Adult, not in good state. Bay of Callao. Presented by Prof. Nation.

46. Clupea notacanthus.

B. 10. D. 20. A. 18. L. lat. 43. L. transv. 16.

A series of spiny scutes between the occiput and the dorsal fin. Scales regularly arranged, *nearly smooth.* The height of the body is contained thrice in the total length (without caudal), the length of the head thrice and one-half. Caudal peduncle as long as deep. Lower jaw slightly projecting beyond the upper; maxillary reaching to behind the middle of the orbit. Teeth none. Ventral fins opposite to the anterior half of the dorsal, the origin of which is nearer to the end of the snout than to the root of the caudal. Caudal fin as long as the head, scaleless. *Suboperculum* obliquely directed upwards and tapering above. There are sixteen abdominal scutes behind the ventral fins. A blackish spot on the shoulder.

Chile.

a–b. Four inches long. Valparaiso. From Mr. Bridge's Collection.

47. Clupea sagax.

Clupea sagax, *Jenyns, Zool. Beagle, Fish.* p. 134.
Alosa melanosticta, *Cuv. & Val.* xx. p. 444 (not *Schleg.*).
Meletta cærulea, *Girard, Proc. Ac. Nat. Sc. Philad.* 1854, p. 138; *U. S. & Pac. R. R. Exped. Fish.* p. 330 (pl. 75. figs. 5–7).
Alosa musica, *Girard, Proc. Ac. Nat. Sc. Philad.* 1854, p. 199: and *U. S. Nav. Astron. Exped. Zool.* p. 246, pl. 31. figs. 1–4
Harengula punctata, *Bleek. Verh. Bat. Gen.* xxv. *Japan*, p. 49 (not *Cuv. & Val.*).

Alausa californica, *Gill, Proc. Acad. Nat. Sc. Philad.* 1862, p. 281.
Alosa fimbriata, *Kner & Steindachner, Sitzgsber. Ak. Wiss. Wien,* 1866, liv. October (pub. 1867), fig. 15.

B. 7. D. 18. A. 18–19. L. lat. 50–54. L. transv. 13.

This species is so closely allied to the European Pilchard that it might be more properly described as a climatal variety.

The height of the body is one-fifth of the total length (without caudal), the length of the head rather more than one-fourth. Lower jaw but slightly prominent; the maxillary extending nearly to the vertical from the middle of the eye. No teeth on the palate or on the tongue. Gill-rakers very fine and long, closely set. Ventral fins inserted below the posterior half of the base of the dorsal. Origin of the dorsal fin nearer to the end of the snout than to the root of the caudal. Abdominal serrature very indistinct; there are about eleven abdominal scutes behind the base of the ventral fins. Operculum with very conspicuous radiating striæ, descending towards the suboperculum. Scales slightly and finely striated, the striæ being most conspicuous on the margin. The scales become very small towards the root of the caudal fin. A series of more or less distinct round blackish spots along the side.

Pacific coasts of America; Japan; New Zealand.

a–c. Adult. San Francisco. Presented by Dr. W. O. Ayres.
d–e. Half-grown. Valparaiso. From Mr. Bridge's Collection.
f. Adult. Chile. Purchased of the Godeffroy Museum as *Alosa fimbriata*.
g. Half-grown. Japan. From Dr. Bleeker's Collection as *Harengula punctata*.

C. *Indian species.*

a. *L. lat.* 80

48. **Clupea indica.**

Clupea indica, *Gray, Ind. Zool.* c. fig.
—— champil, *Gray, l. c.* (young).
Alausa microlepis, *Cuv. & Val.* xx. p. 439; *Bleek. Verh. Bat. Gen.* xxv. *Beng. & Hind.* p. 145.
Pellona champil, *Cuv. & Val.* xx. p. 324.

D. 15. A. 21–22. L. lat. 80.

Scales regularly arranged, smooth. The height of the body is contained twice and two-thirds or thrice in the total length (without caudal), the length of the head thrice and two-thirds. Caudal peduncle nearly as long as deep. The length of the smooth operculum is about two-thirds of its depth. Lower jaw scarcely projecting beyond the upper; maxillary straight, rather narrow, scarcely reaching to below the middle of the orbit. Teeth none. Ventral fins opposite to the anterior half of the dorsal, the origin of which is nearly midway between the end of the snout and the root of the caudal. Caudal fin rather shorter than the head. Suboperculum tapering behind. There are ten abdominal scutes behind the ventral fins. Gill-rakers fine, closely set, shorter than the eye; the horizontal branch of the outer branchial arch consists of two portions joined at an obtuse angle. A dark spot on the shoulder.

Bengal and Assam.

a. Stuffed. Ganges.
b–c. Ganges. Presented by G. R. Waterhouse, Esq.
d–e. Young. Assam. From the Collection of the East-India Company.
f. Half-grown. Cachar. Presented by Lieut.-Col. Playfair.

b. *L. lat. less than* 50.

aa. *Teeth none.*

49. **Clupea palasah.**

The Sablefish.
Palasah, *Russell*, ii. pl. 198.
Alausa palasah, *Cuv. & Val.* xx. p. 432; *Cant. Mal. Fish.* p. 300.

D. 19. A. 17–19. L. lat. 47. L. transv. 17.

Scales regularly arranged. The height of the body is contained thrice in the total length (without caudal), the length of the head thrice and two-thirds. Caudal peduncle as long as deep. The length of the smooth operculum is a little more than two-thirds of its depth. Lower jaw not projecting beyond the upper; maxillary straight, rather narrow, reaching to, or nearly to, the vertical from the hind margin of the orbit. Teeth none. Ventral fins opposite to the front margin of the dorsal, the origin of which is a little nearer to the end of the snout than to the root of the caudal. Caudal fin rather shorter than the head, thickly covered with small scales. Suboperculum somewhat tapering behind. There are fourteen abdominal scutes behind the ventral fins.

Bengal; peninsula of India.

a–c. Adult: stuffed. Ganges.
d. Adult: stuffed. Cochin. Purchased.

50. **Clupea ilisha.**

? Keelee, *Russell*, ii. pl. 195.
Clupea sinensis, (?? *L.*) *Bloch*, taf. 405.
Clupanodon ilisha, *Ham. Buch. Fish. Gang.* p. 243, pl. 19. fig. [illegible]
Clupeonia blochii, *Cuv. & Val.* xx. p. 353.
Alausa toli, *Cant. Mal. Fish.* p. 299 (not *Cuv. & Val.*).
—— ilisha, *Bleek. Verh. Bat. Gen.* xxiv. *Haring*, p. 33.
—— kanagurta, *Bleek. l. c.* p. 34.
—— malayana, *Bleek. Ned. Tydschr. Dierk.* 1866, p. 294.
Alosa chapra, *Günth. in Fish. Zanz.* p. 123 (not *Gray*).

B. 6. D. 18–19. A. 19–21. L. lat. 40–44. L. transv. 15.

Scales regularly arranged. The height of the body is a little more than one-third of the total length (without caudal), the length of the head two-sevenths or rather more than two-sevenths. Caudal peduncle short, as long as deep, or even shorter. *The length of the smooth operculum is nearly one-half of its depth.* Lower jaw scarcely projecting beyond the upper; maxillary reaching to below the middle of the orbit. Teeth none. Ventral fins opposite to the anterior half of the dorsal, the origin of which is a little nearer to the end of the snout than to the root of the caudal. Caudal fin as long as the head, thinly covered with small scales. *Suboperculum rounded and but slightly tapering behind.* There are twelve or thirteen abdominal scutes behind the ventral fins. Lower branch of the outer branchial arch straight, with numerous, fine gill-rakers, the longest of which are longer than the eye. Young with a blackish spot on the shoulder.

Indian ocean and archipelago.

a–b. Adult and young: skins. Pinang. From Dr. Cantor's Collection.
c. Young. Java. From Dr. Bleeker's Collection, as *Alausa ilisha.*
d. Half-grown. From Dr. Bleeker's Collection, as type of *Alausa kanagurta.*
e–f. Adult and half-grown. East-Indian archipelago.
g. Adult: skin. Zanzibar. From Col. Playfair's Collection.
h. Young. Zanzibar. From Col. Playfair's Collection.

I am indebted to Prof. Peters for a renewed examination of the typical specimen of Bloch's *Clupea sinensis.* It is a dried skin, smaller than the figure given by Bloch, with which it otherwise pretty well agrees. It appears to me evident from Prof. Peters's notes on this example that it is *Clupanodon ilisha* of Buchanan. The shape of the gill-covers, which is very characteristic of this species, is well represented in Bloch's figure.

51. Clupea reevesii.

Alosa reevesii, *Richards. Ichth. Chin.* p. 305.
—— palasah, *Richards. l. c.* p. 306.
? Alausa reevesii, *Cuv. & Val.* xx. p. 437 (L. lat. 30!)

D. 17. A. 17–18. L. lat. 43. L. transv. 15.

Scales regularly arranged, with the margin scarcely striated. The height of the body is contained thrice and one-fourth in the total length (without caudal), and nearly equal to the length of the head. Caudal peduncle longer than deep. *The length of the smooth operculum is about three-fourths of its depth.* Lower jaw not projecting beyond the upper; maxillary straight, rather narrow, reaching somewhat beyond the vertical from the middle of the orbit. Teeth none. Ventral fins opposite to the anterior half of the dorsal, the origin of which is nearly midway between the end of the snout and the root of the caudal. Caudal fin rather shorter than the head, thinly covered with small scales. Suboperculum tapering behind. There are thirteen abdominal scutes behind the ventral fins. Lower branch of the outer branchial arch nearly straight, with numerous, fine gill-rakers, the longest of which are a little longer than the eye. Young with a blackish spot on the shoulder.

China.

a–b. Adult (type of the species) and young: stuffed. China. Presented by J. R. Reeves, Esq.
c. Young. China. Presented by J. R. Reeves, Esq.

52. **Clupea toli.**

Alausa toli, *Cuv. & Val.* xx. p. 435.
Alosa ctenolepis, *Bleek. Verh. Bat. Gen.* xxiv. *Haring*, p. 32; or *Nat. Tydschr. Ned. Ind.* iii. p. 74.

D. 17. A. 17–18. L. lat. 40. L. transv. 15.

Scales regularly arranged, with numerous very conspicuous striæ. The height of the body is one-third of the total length (without caudal), *the length of the head one-fourth*. Caudal peduncle longer than deep. The length of the smooth operculum is contained once and three-fourths in its depth. Lower jaw slightly projecting beyond the upper; maxillary reaching somewhat beyond the vertical from the middle of the orbit. Teeth none. Ventral fins opposite to the posterior half of the dorsal, the origin of which is considerably nearer to the end of the snout than to the root of the caudal. *Caudal fin much longer than the head*, thinly covered with small scales. Suboperculum tapering behind. There are twelve abdominal scutes behind the ventral fins. Lower branch of the outer branchial arch nearly straight, with numerous, fine gill-rakers, *the longest of which are much longer the eye.*

East-Indian archipelago.

a. Fine specimen. From Dr. Bleeker's Collection.

53. **Clupea chapra.**

Alosa chapra, *Gray, Ind. Zool.* c. fig.

D. 18. A. 19. L. lat. 42. L. transv. 14.

Scales regularly arranged, adherent, smooth. The height of the body is contained twice and two-thirds in the total length (without caudal), the length of the head four times. Caudal peduncle as long as deep. Suborbitals and opercles smooth. Lower jaw slightly projecting beyond the upper; maxillary rather narrow, reaching to the vertical from the middle of the orbit. Teeth none. Ventral fins opposite to the middle of the dorsal, the origin of which is much nearer to the end of the snout than to the root of the caudal. Caudal fin very long, longer than the head, covered with small scales. Suboperculum rather tapering behind. There are thirteen abdominal scutes behind the ventral fins. Lower branch of the outer branchial arch nearly straight, with numerous, fine gill-rakers, the longest of which are rather shorter than the eye. Suboperculum nearly twice as deep as long. Caudal fin with black margins.

Bengal.

a–b. Fine specimens, 6 inches long. Bengal. Presented by G. R. Waterhouse, Esq.

54. Clupea macrura.

Alausa macrurus, (*Kuhl & v. Hass.*) *Bleek. Verh. Bat. Gen.* xxiv. *Haring*, p. 31; and *Nat. Tydschr. Ned. Ind.* iv. p. 501.

B. 6. D. 17–18. A. 19. L. lat. 44. L. transv. 14.

Scales regularly arranged, with the margin scarcely striated. The height of the body is one-third of the total length (without caudal), *the length of the head two-ninths.* Caudal peduncle as long as deep. Suborbitals and opercles with numerous venules. Lower jaw not projecting beyond the upper; maxillary rather narrow, reaching somewhat beyond the vertical from the front margin of the orbit. Teeth none. Ventral fins opposite to the middle of the dorsal, the origin of which is much nearer to the end of the snout than to the root of the caudal. *Caudal fin very long*, much longer than the head, covered with small scales. Suboperculum rounded behind. There are twelve abdominal scutes behind the ventral fins. Lower branch of the outer branchial arch nearly straight, with numerous, fine gill-rakers, *the longest of which are considerably shorter than the eye.*

Java; Sumatra; Singapore.

a. Adult: type of the species. From Dr. Bleeker's Collection.

55. Clupea platygaster.

? Alausa brevis, *Bleek. Verh. Bat. Gen.* xxiv. *Haring*, p. 35.
Alausa brachysoma, *Bleek. Nat. Tydschr. Nederl. Ind.* v. p. 527 (*not* Sardinella brachysoma).

B. 6. D. 17. A. 21. L. lat. 42. L. transv. 15.

Scales regularly arranged, nearly smooth. The height of the body is contained twice and one-third in the total length (without caudal), the length of the head thrice and one-half. Caudal peduncle as long as deep. The length of the smooth operculum is a little less than one-half of its depth. Lower jaw slightly projecting beyond the upper; maxillary reaching to below the middle of the orbit. Teeth none. Ventral fins opposite to the middle of the dorsal, the origin of which is much nearer to the end of the snout than to the root of the caudal. Caudal fin nearly as long as the head, thinly covered with small scales. Suboperculum rounded behind. There are twelve abdominal scutes behind the ventral fins. Lower branch of the outer branchial arch nearly straight, with numerous, fine gill-rakers, which are longer than the eye. A blackish spot on the shoulder.

Sumatra.

a. Type of the species. Padang. From Dr. Bleeker's Collection.

56. Clupea scombrina.

The Oil-sardine.
Meer-bleyer, *Nieuhoff, Ind.* ii. p. 268. fig. 5, copied by *Willughby, Ichthyol. Append.* p. 2, tab. 1. fig. 2 (bad).
? Sardinella neohowii, *Cuv. & Val.* xx. p. 274.

Sardinella neohowii, *Day, Fish. Malab.* p. 230.
Alosa scombrina, *Cuv. & Val.* xx. p. 442.
? Alosa scombrina, *Day, Fish. Malab.* p. 236.

D. 17. A. 15. L. lat. 48. L. transv. 13.

The height of the body is less than *the length of the head, which is contained thrice and one-fourth in the total (without caudal).* Scales regularly arranged, thin, adherent, with the margin finely serrated. Lower jaw projecting beyond the upper; the maxillary extending beyond the front margin of the orbit. Teeth none on the palate or the tongue. Opercles smooth; *suboperculum truncated behind. Eye* of moderate size, shorter than the snout, *one-fifth of the length of the head.* Ventral fin inserted below the posterior half of the dorsal fin, the base of which is nearer to the root of the caudal fin than to the end of the snout. There are fifteen abdominal scutes behind the ventral fin. Back greenish, sides silvery.

Eastern coast of the Indian peninsula; Ceylon.

a. Adult: skin. Cochin. Purchased.

57. Clupea melanura.

Alausa melanura, *Cuv. & Val.* xx. p. 441; *Bleek. Verh. Bat. Gen.* xxiv. *Haring,* p. 32; ? *Day, Fish. Malab.* p. 235.

B. 6. D. 15–16. A. 18. L. lat. 35.

The height of the body is two-ninths of the total length (with the caudal), the length of the head one-fifth; the diameter of the eye equals the length of the snout, and is two-sevenths of that of the head. Maxillary reaching to below the middle of the eye. Teeth none. Scales smooth. Ventral fins opposite to the anterior part of the dorsal. Extremities of the caudal lobes black.

Indian ocean and archipelago.

bb. *Teeth on the tongue.*

58. Clupea venenosa.

Meletta venenosa, *Cuv. & Val.* xx. p. 377.

B. 5. D. 16. A. 17. L. lat. 42–44. L. transv. 11.

The height of the body is equal to the length of the head, which is one-fourth of the total (without caudal). Lower jaw slightly prominent; the maxillary extending beyond the vertical from the front margin of the eye. No teeth on the palate; tongue with a very narrow strip of minute teeth. Operculum smooth; suboperculum short, subtruncated behind. Gill-rakers fine and closely set, shorter than the eye. Gill-cavity not black. Ventral fin inserted below the middle of the base of the dorsal. Origin of the dorsal fin nearer to the end of the snout than to the root of the caudal. There are thirteen abdominal scutes behind the base of the ventral fins. Length of the pectoral fin two-thirds of the distance of its root from the ventral fin. Scales nearly smooth, with some vertical striæ. Silvery, back bluish.

Indian Ocean.

a, *b–c*, *d–f*. Adult and half-grown. Zanzibar. From Lieut.-Col. Playfair's Collection.

59. Clupea lile.

Meletta lile, *Cuv. & Val.* xx. p. 378.

B. 5. D. 14. A. 17. L. lat. 40.

Upper profile nearly straight, the lower very convex. The height of the body is contained thrice and two-thirds in the total length (with the caudal), the length of the head five times and one-half. Lower jaw but slightly projecting beyond the upper. No teeth on the palate; tongue with a band of minute teeth. Ventral fin inserted below the anterior dorsal rays. Scales adherent. A silvery band along the side. (*Val.*)

Coast of Malabar.

60. Clupea kowal.

Kowal, *Russell*, pl. 186.
Clupea kowal, *Rüppell, Neue Wirbelth. Fische*, p. 79.
? Kowala thoracata, *Cuv. & Val.* xx. p. 363.
Kowala thoracata, *Cant. Mal. Fish.* p. 269.
Clupalosa bulan, *Bleek. Verh. Bat. Gen.* xxii. *Madura*, p. 12, and xxiv. *Haring*, p. 30.

D. 17–18. A. 19–20. L. lat. 46. L. transv. 11.

The length of the head is contained four times in the total (without caudal), the height of the body thrice and a half. Scales regularly arranged, thin, deciduous, *each crossed by several vertical lines.* Lower jaw prominent, the maxillary extending beyond the front margin of the orbit. Teeth none on the palate, a few rudimentary teeth along the median ridge of the tongue. Cheeks with venules; opercles smooth. Gill-rakers fine and closely set, shorter than the eye. Eye as long as the snout (which is of moderate extent), contained thrice and one-third in the length of the head. Ventral fin inserted below the middle of the dorsal fin, the base of which is midway between the end of the snout and the root of the caudal fin. There are fifteen rather prominent abdominal scutes behind the base of the ventral fin. Silvery, back with some darker longitudinal streaks.

Red Sea; Indian Ocean; China.

a. Adult: skin. Zanzibar. From Lieut.-Col. Playfair's Collection.
b. Adult: skin. Pinang. From Dr. Cantor's Collection.
c. Type of *Clupalosa bulan*, Blkr., in bad state. Madura. From Dr. Bleeker's Collection.
d. Fine specimen. Amoy. Purchased of Mr. Stevens.

Dr. Bleeker's description of *Clupalosa bulan* is incorrect with regard to the number of scales, size of the eye, &c.

61. Clupea zunasi.

Clupea kowal, *Schleg. Faun. Japon. Poiss.* p. 235, tab. 7. fig. 1 (not *Rüpp.*).
Harengula zunasi, *Bleek. Verh. Bat. Gen.* xxvi. *Japan*, p. 117.

D. 17. A. 17. L. lat. 40.

The height of the body equals the length of the head, which is a little more than one-fourth of the total (without caudal), head longer than deep. Scales regularly arranged, thin, deciduous, with the margin entire and scarcely crenulated. Abdominal profile not more convex than the dorsal. Lower jaw projecting beyond the upper; snout short, maxillary extending beyond the front margin of the orbit. No teeth on the palate *; tongue with a median line of minute teeth. Opercles smooth. Gill-rakers fine and closely set, shorter than the eye. Eye as long as the snout, two-sevenths of the length of the head. Ventral fin inserted below the middle of the dorsal fin, the origin of which is conspicuously nearer to the end of the snout than to the root of the caudal fin. There are fourteen abdominal scutes behind the base of the ventral fin. Back greenish, sides silvery.

Japan.

a. Type of the species. Nagasaki. From Dr. Bleeker's Collection.

6. CLUPEOIDES.

Clupeoides, *Bleek. Nat. Tydschr. Ned. Ind.* i. p. 274.

Body oblong, moderately compressed, with the abdominal serrature commencing behind the pectoral fins. Scales of moderate size. Lower jaw longer than the upper. Teeth, if present, rudimentary and deciduous. Anal fin of moderate extent, with less than 20 rays; dorsal fin opposite to the ventrals. Caudal forked.

Borneo.

1. Clupeoides hypselosoma.

Clupeoides hypselosoma, *Bleek. Ned. Tydschr. Dierk.* iii. 1866, p. 293.

D. 15. A. 16. L. lat. 37. L. transv. 10.

The height of the body is contained thrice and one-third in the total length (without caudal), the length of the head thrice and a half; lower jaw scarcely projecting beyond the upper; maxillary extending beyond the front margin of the eye. Origin of the dorsal fin midway between the end of the snout and the root of the caudal, and opposite to the base of the ventrals. Seven slender postventral spines.

Borneo.

a. Type of the species, 2 inches long. Bandjermassing. From Dr. Bleeker's Collection.

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* Bleeker describes palatine and pterygoid teeth; they are not present in the single specimen examined by him and myself.

2. Clupeoides borneensis.

Clupeoides borneensis, *Bleek. Nat. Tydschr. Ned. Ind.* i. p. 275.

D. 15. A. 16. L. lat. 39. L. transv. 12.

The height of the body equals the length of the head, and is one-fourth of the total (without caudal); lower jaw scarcely projecting beyond the upper; maxillary reaching to below the front margin of the eye. Origin of the dorsal fin midway between the end of the snout and the root of the caudal, and opposite to the base of the ventral. Nine postventral spines.

Borneo.

a. Type of the species, 2½ inches long. Bandjermassing. From Dr. Bleeker's Collection.

b–d. Two inches long. From the Haslar Collection.

3. Clupeoides pseudopterus.

Spratella pseudopterus, *Bleek. Verh. Bat. Gen.* xxiv. *Haring*, p. 50; or *Nat. Tydschr. Ned. Ind.* iii. p. 432.

D. 13. A. 14+ii. L. lat. 37. L. transv. 9.

The length of the head is nearly equal to the height of the body, and one-fourth of the total (without caudal); lower jaw slightly projecting beyond the upper; maxillary reaching somewhat beyond the front margin of the eye. Origin of the dorsal fin a little nearer to the root of the caudal than to the end of the snout, immediately behind the base of the ventrals. The two last anal rays detached from the fin. Six postventral spines.

Borneo.

a. One of the typical specimens, 2 inches long. Pamangkat. From Dr. Bleeker's Collection.

The fish which served for the figure of *Corica guborni*, Gray, Ind. Zool., was, perhaps, similar to *Cl. pseudopterus*; it is also represented with separate anal finlets.

7. PELLONULA.

Body oblong, compressed, the abdominal serrature commencing from the pectorals. Scales of moderate size, adherent; lateral line none. Maxillary articulated behind the intermaxillary. Dentition well developed. A single series of moderate-sized teeth in the intermaxillary, and a patch of similar teeth anteriorly on the palatines; smaller teeth in the lower jaw and on the tongue; maxillary teeth minute. Anal fin of moderate length, with less than twenty rays; dorsal fin opposite to ventrals. Gill-membranes separate, with six branchiostegals. Pseudobranchiæ well developed.

West Africa.

1. Pellonula vorax.

B. 6. D. 17. A. 18. L. lat. 43–45.

The length of the head is contained thrice and two-thirds or four times in the total (without caudal), the height of the body from thrice and one-sixth to thrice and three-fourths. Snout conical, with the lower jaw prominent, as long as the diameter of the eye, which is contained thrice and one-third in the length of the head. Maxillary narrow, extending beyond the vertical from the front margin of the eye. Origin of the dorsal fin scarcely nearer to the end of the snout than to the root of the caudal, and opposite to the root of the ventrals. Pectoral terminating at some distance from the ventrals. There are ten spinous scutes behind the ventrals. Gill-rakers setiform, rather shorter than the eye. Back reddish-brown, a silvery band runs along the side of the body.

West Africa.

a. Four inches long. West Africa. From Mr. Fraser's Collection.
b. Two and a half inches long. River Niger. From Mr. Fraser's Collection.
c. Four inches long. Presented by Dr. A. Günther.

8. CLUPEICHTHYS.

Clupeichthys, *Bleek. Nat. Tydschr. Ned. Ind.* ix. p. 274.

Body oblong, compressed, with the abdominal serrature commencing from the pectoral fins. Scales deciduous, of moderate size. Lower jaw longer than the upper; structure of the jaws as in *Clupea*. Dentition strong; a series of canine-like teeth in the mandibles; intermaxillary with several still stronger teeth; maxillary, palatines, and tongue with smaller curved teeth. Anal fin of moderate extent, with less than twenty rays; dorsal fin opposite to ventrals; caudal fin forked. Pseudobranchiæ well developed; gill-membranes entirely separate.

Sumatra.

1. Clupeichthys goniognathus.

Bleek. l. c. p. 275.

B. 6. D. 15. A. 15 + ii. L. lat. 40.

The height of the body is one-fourth of the total length, and nearly equal to the length of the head; snout longer than the eye; cleft of the mouth wide, the maxillary extending to below the middle of the eye. Origin of the dorsal fin in advance of the root of the ventrals, nearly midway between the end of the snout and the root of the caudal. Seven prominent spines behind the ventrals. Body with a silvery longitudinal band.

Rivers of Sumatra.

a. Type of the species, 3½ inches long. From Dr. Bleeker's Collection.

9. PELLONA *.

Pellona, *Cuv. & Val.* xx. p. 300.

Body much compressed, with the thorax and abdomen strongly serrated. Scales of moderate size, rarely small. Lower jaw prominent. Cleft of the mouth of moderate width; rasp-like bands of minute teeth on the palatine and pterygoid bones and on the tongue; none on the vomer. Anal fin very long, many-rayed (37–54); dorsal fin behind the ventrals, sometimes opposite to the anterior anal rays. Ventral fins present but small · the upper pectoral ray strong. Caudal fin deeply forked.

Tropical parts of the Atlantic and Indian Oceans.

I should have placed these fishes in a subgeneric division of *Pristigaster*, if the presence of the ventral fins had been the only character by which the genus could be distinguished; but it has also a considerably shorter anal fin. Some of the species lead off to *Pristigaster*; and these are placed last in the following arrangement:—

a. Dorsal fin in front of anal, its origin not being nearer to the caudal than to the end of the snout, p. 454.

b. Dorsal fin partly opposite to the anterior anal rays, its origin being nearer to the caudal than to the end of the snout, p. 457.

c. Dorsal fin entirely opposite to the anal, p. 459.

a. *Dorsal fin in front of anal, its origin not being nearer to the caudal than to the end of the snout.*

1. Pellona flavipinnis.

Pristigaster flavipinnis, *Valenc. in D'Orb. Voy. Amér. Mérid. Poiss.* pl. 10. fig. 2.
Pellona orbignyana, *Cuv. & Val.* xx. p. 302.
—— castelnæana, *Cuv. & Val.* xx. p. 306.

D. 19–20. A. 40. L. lat. 65. L. transv. 18.

The height of the body is contained thrice and two-fifths in the total length (without caudal), the length of the head thrice and four-fifths. The diameter of the eye is one-fourth of the length of the head. The posterior halves of the ridges on the upper surface of the head are distinctly convergent anteriorly, and very slightly so posteriorly. Origin of the dorsal fin midway between the end of the snout and the root of the caudal. Length of the base of the anal fin two-sevenths of the total length (without caudal). Ventral fins longer than the eye.

Atlantic coasts of South America.

a. Adult. Surinam. Purchased of Mr. Frank.

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* 1. Clupea melastoma, *Bl. Schn.* p. 427; Pellona melastoma, *Cuv. & Val.* xx. p. 308.—Coast of Coromandel.
2. Ditchelee, *Russell*, ii. p. 72, pl. 188; Pellona ditchela, *Cuv. & Val.* xx. p. 314.—Coast of Coromandel.
3. Pellona micropus, *Cuv. & Val.* xx. p. 320.—Coast of Coromandel; Bengal.
4. —— filigera, *Cuv. & Val.* xx. p. 322.—Peninsula of India.
5. —— motius, *Cuv. & Val.* xx. p. 323 (not *Ham. Buch.*).—Ganges.

2. Pellona africana.

Clupea africana, *Bl.* ix. p. 45, tab. 407; *Bl. Schn.* p. 425.
Clupanodon africanus, *Lacép.* v. pp. 469, 471.
Pellona iserti, *Cuv. & Val.* xx. p. 307.
—— gabonica, *A. Dum. Arch. Mus.* x. p. 259, pl. 23. figs. 3, 3*a*.
—— africana, *Bleek. Verhand. Holl. Maatsch. Haarlem*, 1862, *Guinée*, p. 122, tab. 26. fig. 1.

D. 15. A. 42–47. L. lat. 43. L. transv. 16.

The height of the body is contained twice and three-fourths in the total length (without caudal), the length of the head thrice and three-fourths. Eye very large, a little more than one-third of the length of the head. The posterior halves of the ridges on the upper surface of the head convergent behind. Origin of the dorsal fin a little nearer to the end of the snout than to the root of the caudal. Length of the base of the anal fin two-fifths of the total length (without caudal). Ventral fins much shorter than the eye.

West coast of Africa.

a. Adult. From the Collection of the Zoological Society.

3. Pellona ditchoa.

? Ditchoee, *Russell*, ii. p. 78, pl. 192.
Pellona ditchoa, *Cuv. & Val.* xx. p. 313; *Bleek. Verh. Bat. Gen.* xxiv. *Haring*, p. 24.

D. 16–17. A. 37. L. lat. 45. L. transv. 14.

The height of the body is contained twice and three-fifths in the total length (without caudal), the length of the head thrice and three-fifths. The diameter of the eye is one-third of the length of the head. The posterior halves of the ridges on the upper surface of the head run parallel to each other. Origin of the dorsal fin nearer to the end of the snout than to the root of the caudal. Length of the base of the anal fin one-third of the total (without caudal). Ventral fins shorter than the eye.

Indian Ocean.

a. Adult. Java. From Dr. Bleeker's Collection.
b. Adult. Zanzibar. From Lieut.-Col. Playfair's Collection.
c–d. Adult: skins, in bad state. East Africa. From Lieut.-Col. Playfair's Collection.

4. Pellona hoevenii.

Bleek. Verh. Bat. Gen. xxiv. *Haring*, p. 21; or *Nat. Tydschr. Ned. Ind.* iii. p. 712.

D. 18. A. 37. L. lat. 45. L. transv. 13.

The height of the body is one-third of the total length (without caudal), the length of the head two-sevenths; the diameter of the eye is one-third of the length of the head. The posterior halves of the ridges on the upper surface of the head are convergent behind. Origin of the dorsal fin midway between the end of the snout and the root of the caudal. Length of the base of the anal fin two-sevenths of the total (without caudal). Ventral fins shorter than the eye.

East-Indian archipelago.

a. One of the typical specimens. From Dr. Bleeker's Collection.
b. Adult. Amboyna. Purchased of Mr. Frank.

5. Pellona motius.

? Jangarloo, *Russell*, ii. p. 73, pl. 191.
Clupanodon motius, *Ham. Buch. Fish. Gang.* p. 251.
Clupea motius, *Gray, Ind. Zool.* c. fig. (*not* Pellona motius, *Cuv. & Val.*).
Pellona leschenaultii, *Bleek. M. O. Java*, p. 11 (not *Cuv. & Val.*).
—— russellii, *Bleek. Verh. Bat. Gen.* xxiv. *Haring*, p. 23; or *Nat. Tydschr. Ned. Ind.* iii. p. 72.

D. 18. A. 43–46. L. lat. 43–45. L. transv. 13.

The height of the body is a little less than one-third of the total length (without caudal), the length of the head two-ninths or rather less than two-ninths. Eye very large, scarcely less than one-third of the length of the head. The posterior halves of the ridges on the upper surface of the head run parallel to each other. Origin of the dorsal fin midway between the end of the snout and the root of the caudal. Length of the base of the anal one-third, or rather more than one-third, of the total length (without caudal). Ventral fins shorter than the eye.

East Indies, coasts and rivers.

a. Half-grown. Bengal. Presented by G. R. Waterhouse, Esq.
b. One of the typical specimens of *P. russellii*. From Dr. Bleeker's Collection.

6. Pellona brachysoma.

Bleek. Verh. Bat. Gen. xxiv. *Haring*, p. 22.

D. 17. A. 49. L. lat. 40. L. transv. 16.

The height of the body is contained twice and three-fifths in the total length (without caudal), the length of the head thrice and two-thirds; the diameter of the eye is rather more than one-third of the length of the head. The posterior halves of the ridges on the upper surface of the head run parallel to each other. Origin of the dorsal fin nearer to the end of the snout than to the root of the caudal. Length of the base of the anal fin two-fifths of the total (without caudal). Ventral fins shorter than the eye.

Java, Sumatra.

a. One of the typical specimens. From Dr. Bleeker's Collection.

7. Pellona elongata.

Alosa elongata, *Bennett, Mem. Raffles*, p. 691.
Clupea affinis, *Gray, Ind. Zool.* c. fig.
Ilisha abnormis, (*Gray*) *Richards. Ichth. Chin.* p. 306.
Clupea melastoma, *Schleg. Faun. Japon. Poiss.* p. 237, pl. 108. fig. 1 (not *Bl.*).

Pellona vimbella, *Cuv. & Val.* xx. p. 317.
—— grayana, *Cuv. & Val.* xx. p. 315; *Bleek. Verh. Bat. Gen.* xxiv. *Haring*, p. 25.
—— affinis, *Cant. Mal. Fish.* p. 291.
—— schlegelii, *Bleek. Verh. Bat. Gen.* xxvi. *Japan*, p. 118.

D. 16. A. 46–52. L. lat. 50–53. L. transv. ca 16.

The height of the body is contained thrice and a half or thrice and three-fourths in the total length (without caudal), the length of the head four times. The diameter of the eye is one-fourth, or rather less than one-fourth, of the length of the head. The posterior halves of the ridges on the upper surface of the head run nearly parallel to each other. Origin of the dorsal fin midway between the end of the snout and the root of the caudal. Length of the base of the anal a little more than one-third of the total length (without caudal). Ventral fins shorter than the eye.

East-Indian and Chinese seas.

a. Adult: dried. Sumatra. From Sir T. St. Raffles's Collection.—Type of the species.
b. Adult. East-Indian archipelago. From Dr. Bleeker's Collection as *Pellona affinis*.
c. Adult: stuffed. China. Presented by J. R. Reeves, Esq.—Type of *Ilisha abnormis*.
d–e. Half-grown. China.
f. Young. Amoy. Purchased of Mr. Stevens.
g, h. Young. China. From Dr. Cantor's Collection.
i. Adult. Japan. From Dr. Bleeker's Collection.—Type of *P. schlegelii*.
k. Adult. Japan. Purchased of Mr. Jamrach.

8. **Pellona dussumieri.**

Cuv. & Val. xx. p. 316, pl. 596.

D. 18. A. 44–54.

Scales rather large. The height of the body is two-sevenths of the total length (without caudal), the length of the head one-fourth. The diameter of the eye is at least one-third of the length of the head. Origin of the dorsal fin nearly midway between the end of the snout and the root of the caudal. (*Val.*)

Peninsula of India.

b. *Dorsal fin partly opposite to the anterior anal rays, its origin being nearer to the caudal than to the end of the snout.*

9. **Pellona xanthoptera.**

Bleek. Verh. Bat. Gen. xxiv. *Haring*, p. 49; or *Nat. Tydschr. Ned. Ind.* ii. p. 439.

D. 16. A. 48–50. L. lat. 50.

The height of the body is contained thrice in the total length (without caudal), the length of the head thrice and three-fourths.

The diameter of the eye is two-sevenths of the length of the head; profile of the nape rather concave. The posterior halves of the ridges on the upper surface of the head run parallel to each other. Origin of the dorsal fin somewhat nearer to the root of the caudal than to the end of the snout. The posterior third of the dorsal fin is above the anterior anal rays. Length of the base of the anal fin contained four times and three-fourths in the total length (without caudal). Ventral fins much shorter than the eye.

Western Borneo.

a. One of the typical specimens, not in good state. From Dr. Bleeker's Collection.

b–c. Half-grown and young. East Indies. Presented by G. R. Waterhouse, Esq.

10. **Pellona macrogaster.**

Ilisha macrogaster, *Bleek. Ned. Tydschr. Dierk.* iii. 1866, p. 300.

D. 16. A. 47. L. lat. 50.

The height of the body is contained twice and four-fifths in the total length (without caudal), the length of the head thrice and three-fourths; abdominal profile very convex, much more so than the dorsal; profile of the nape nearly straight. The diameter of the eye is more than one-third of the length of the head. The posterior thirds of the ridges on the upper surface of the head run parallel to each other. The posterior half of the dorsal fin is above the anterior anal rays; its origin is a little nearer to the root of the caudal than to the end of the snout. Length of the base of the anal fin two-fifths of the total (without caudal). Ventral fins exceedingly short.

Borneo.

a. Type of the species, 5½ inches long. Sambas. From Dr. Bleeker's Collection.

11. **Pellona novacula.**

? Pellona novacula, *Cuv. & Val.* xx. p. 319.
Ilisha novacula, *Bleek. Ned. Tydschr. Dierk.* iii. 1866, p. 302.

D. 17. A. 42. L. lat. 45.

The height of the body is contained thrice and a half in the total length (without caudal), the length of the head thrice and two-thirds; abdominal profile not very convex, not more so than the dorsal; profile of the nape concave. The diameter of the eye is two-ninths of the length of the head. The posterior halves of the ridges on the upper surface of the head slightly divergent. The posterior third of the dorsal fin is above the anterior anal rays; its origin is nearer to the root of the caudal than to the end of the snout. Length of the base of the anal fin somewhat less than one-third of the total (without caudal). Ventral fins exceedingly short.

Java; ? Rangoon.

a. Adult. Batavia. From Dr. Bleeker's Collection.

12. Pellona leschenaultii.

Cuv. & Val. xx. p. 311.

D. 21. A. 42. L. lat. 70.

The height of the body is contained a little less than four times in the total length (with the caudal). Pectoral fins reaching beyond the root of the ventrals, which are small, and inserted eight or nine scales in advance of the dorsal. (*Val.*)

Pondicherry.

This species, although apparently well characterized, appears to be very uncertain, as it is founded on a single dried example.

c. *Dorsal fin entirely opposite to the anal.*

13. Pellona pristigastroides.

Bleek. Verh. Bat. Gen. xxiv. *Haring*, p. 20.

D. 17. A. 49. L. lat. 50.

The height of the body is contained thrice and one-third in the total length (without caudal), the length of the head four times and one-fourth. The diameter of the eye is one-fourth of the length of the head. Profile of the nape concave, that of the abdomen very convex, with the spines very prominent. The posterior halves of the ridges on the upper surface of the head slightly divergent behind. Dorsal fin nearly entirely opposite to the anal, its origin being nearer to the root of the caudal than to the end of the snout. Ventral fins rudimentary.

Java; Borneo.

a. Type of the species. From Dr. Bleeker's Collection.

14. Pellona amblyuroptera.

Bleek. Verh. Bat. Gen. xxiv. *Haring*, p. 21.

D. 17. A. 44 (49, *Blkr.*). L. lat. 54. L. transv. 16.

The height of the body is contained thrice and one-third in the total length (without caudal), the length of the head thrice and three-fourths. The diameter of the eye is two-ninths of the length of the head. Profile of the nape slightly concave, that of the abdomen scarcely more convex than the dorsal. The posterior halves of the ridges on the upper surface of the head divergent behind. Dorsal fin nearly entirely opposite to the anal, its origin being nearer to the root of the caudal than to the end of the snout. Ventral fins rudimentary.

Java; Sumatra; Siam.

a. Adult. From Dr. Bleeker's Collection.

10. PRISTIGASTER *.

Odontognathus, *Lacép.* ii. p. 220; *Cuv. Règne An.*
Gnathobolus, *Bl. Schn.* p. 556.
Pristigaster, *Cuv. Règne Anim.*
Raconda, *Gray, Zool. Misc.* p. 9.
Pristigaster *et* Opisthopterus, *Gill, Proc. Ac. Nat. Sc. Philad.* 1861, p. 31.

Body much compressed, with the abdominal serrature very conspicuous. Scales of moderate size, thin, deciduous. Lower jaw projecting beyond the upper. Distinct bands of small, villiform teeth along the palatine and pterygoid bones and along the tongue, none on the vomer. Anal fin very long, with more than fifty rays; dorsal fin, if present, opposite to the origin or the middle of the anal fin. *Ventral fins none.* Caudal deeply forked.

Tropical seas.

The species may be subdivided thus:—

A. Dorsal fin, if present, behind the origin of the anal.
  1. Maxillary not prolonged backwards: *Pristigaster*, p. 460.
  2. Maxillary tapering and prolonged backwards in adult examples.
    a. Dorsal fin present: *Odontognathus*, p. 462.
    b. Dorsal fin none: *Raconda*, p. 462.

B. Dorsal fin nearly opposite to the origin of the anal, p. 463.

A. *Dorsal fin, if present, behind the origin of the anal.*

1. *Maxillary not prolonged backwards*: Pristigaster.

1. Pristigaster tartoor.

Tartoore, *Russell*, ii. p. 74, pl. 193.
Pristigaster tartoor, *Cuv. & Val.* xx. p. 328; *Bleek. Verh. Bat. Gen.* xxiv. *Haring*, p. 25; *Day, Fish. Malab.* p. 232.
Opisthopterus tartoor, (*Gill*) *Bleek. Ned. Tydschr. Dierk.* iii. 1866, p. 296.

B. 6. D. 13–17. A. 57–65. L. lat. 50–60.

The height of the body is one-fourth of the total length (without caudal), the length of the head one-fifth. Origin of the dorsal fin equidistant between the root of the caudal and the vertical from that of the pectoral. The length of the maxillary is less than one-half of that of the head; its posterior (supplementary) portion reaches nearly to the end of the bone, and is rather broad.

East Indies.

a. From Dr. Bleeker's Collection.

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* 1. Pristigaster chinensis, *Basilewski, Nouv. Mém. Soc. Nat. Mosc.* x. 1855, p. 243.—China.

2. Pristigaster macrognathus.

Opisthopterus macrognathus, *Bleek. Nederl. Tydschr. Dierk.* iii. 1866, p. 299.

D. 16. A. 57–62. L. lat. 52.

The height of the body is two-sevenths or one-third of the total length (without caudal), the length of the head two-ninths. Origin of the dorsal fin equidistant between the root of the caudal and the vertical from that of the pectoral. The length of the maxillary is more than one-half of that of the head in adult examples, and equal to one-half in specimens 5 inches long; its posterior (supplementary) portion is broad, and posteriorly overlapped by the dilated part of the dentigerous portion.

East-Indian archipelago.

a. One of the typical specimens. From Dr. Bleeker's Collection.
b. Half-grown. Sarawak. Presented by the Marquis Doria.
c. Adult. From the Collection of the Zoological Society.

3. Pristigaster macrops.

Günth. Proc. Zool. Soc. 1866, p. 603.

D. 13. A. 61. L. lat. 53. L. transv. 17.

The height of the body is one-third of the total length (without caudal), the length of the head two-ninths; the diameter of the eye is one-third of the length of the head. Origin of the dorsal fin midway between the root of the caudal and scapula. The length of the maxillary is less than one-half of that of the head; and its posterior (supplementary) portion is narrow, extending to the extremity of the bone. Silvery, scapula black.

Panama.

a. Fine specimen, type of the species. From Mr. Salvin's Collection.

4. Pristigaster dovii.

Pristigaster argenteus, *Günth. Proc. Zool. Soc.* 1866, p. 603 (not *Cuv.*).

D. 11. A. 56. L. lat. 51. L. transv. 13.

The height of the body is two-sevenths of the total length (without caudal), the length of the head rather more than one-fifth; the diameter of the eye is two-sevenths of the length of the head. Origin of the dorsal fin considerably nearer to the root of the caudal than to the scapula. The length of the maxillary is less than one-half of that of the head, and its posterior (supplementary) portion is of moderate width, extending to the extremity of the bone.

Panama.

a. Type of the species. Presented by Captain Dow.

2. *Maxillary prolonged backwards in adult examples.*

a. *Dorsal fin present*: Odontognathus.

5. Pristigaster mucronatus.

Odontognathus mucronatus, *Lacép.* ii. p. 221, pl. 7. fig. 2.
Gnathobolus, *Bl. Schn.* p. 556.
Gnathobolus mucronatus, *Cuv. & Val.* xxi. p. 91, pl. 611.

D. 11–12. A. 74–78–82.

Scales? The height of the body is contained four times and two-thirds in the total length (without caudal), the length of the head five times. The diameter of the eye equals the extent of the snout, and is two-sevenths of the length of the head. Maxillary tapering and extending downwards to the edge of the interoperculum in an example four inches long, obliquely truncated and conspicuously shorter in another of three inches. Origin of the dorsal fin twice as distant from the eye as from the root of the caudal. There are eight spines along the thoracic region, and eleven along the abdominal.

Guyanas.

a–b. We have only two examples of this singular species, 4 and 3 inches long; they are evidently young and perfectly diaphanous. They illustrate well the development of the upper jaw with age, which may be also observed in *Raconda russelliana*, to which they are most closely allied.

b. *Dorsal fin none*: Raconda.

6. Pristigaster russellianus.

Raconda russelliana, *Gray, Zool. Misc.* p. 9; *Cant. Mal. Fish.* p. 292.
Apterygia ramcarate, *Gray, Ind. Zool.* c. fig. (not good).
—— hamiltonii, *Cuv. & Val.* xx. p. 333.

A. 83–86. L. lat. 60.

The height of the body is contained thrice and four-fifths in the total length (without caudal), the length of the head five times and three-fourths. The diameter of the eye is more than the length of the snout, and contained thrice and one-third in that of the head. Maxillary tapering and produced in adult examples, in which it extends backwards to the gill-opening, much shorter in immature specimens, in which it reaches only to the mandibulary joint. There are about thirty-one feeble spines along the lower profile.

Bay of Bengal; Malayan peninsula.

a–b. Adult (8 inches) and half-grown. Bengal. Presented by G. R. Waterhouse, Esq.
c–d. Young, types of the species.
e. Adult, type of *Apterygia ramcarate*. Presented by General Hardwicke.
f. Adult: skin. Pinang. From Dr. Cantor's Collection.
g. Adult: skin. From the Collection of the Zoological Society.

B. *Dorsal fin nearly opposite to the origin of the anal.*

7. Pristigaster cayanus.

Pristigaster cayanus, *Cuv. Règne An.* pl. 10. fig. 3.
—— martii, *Agass. in Spix, Pisc. Bras.* p. 55, tab. 24 *a*; *Cuv. & Val.* xx. p. 337.
—— cayanus, *Cuv. & Val.* xx. p. 334, pl. 597.
—— phaeton, *Cuv. & Val.* xx. p. 338; *Casteln. Anim. Amér. Sud*, p. 37, pl. 28. fig. 3.

B. 6. D. 15. A. 46–52.

Abdominal profile very convex, subsemicircular. The height of the body is one-half of the total length (without caudal), the length of the head one-fourth. Origin of the dorsal fin much nearer to the extremity of the snout than to the root of the caudal. Scales of moderate size. The upper rays of the caudal fin sometimes produced into filaments.

Atlantic coasts of Tropical America.

11. CHIROCENTRODON.

Body oblong, much compressed, covered with deciduous scales; abdominal serrature commencing on the thorax. Lower jaw projecting beyond the upper; structure of the jaws as in *Clupea*. Dentition strong: a pair of strong canine teeth anteriorly in the lower jaw; intermaxillary armed in a similar manner; maxillary teeth very distinct; narrow bands of teeth on the vomer, palatine, and pterygoid bones, and on the tongue. Anal fin long, with more than thirty rays; dorsal fin opposite to the anal. Ventral fins very small. Caudal forked. Branchiostegals six, short and broad.

West Indies.

1. Chirocentrodon tæniatus.

B. 6. D. 15. A. 41. V. 6.

The height of the body is contained four times and two-thirds in the total length (without caudal), the length of the head four times and one-fourth. Snout compressed, longer than the eye, the diameter of which is two-sevenths of the length of the head. Maxillary large, extending nearly to the vertical from the hind margin of the eye. Gill-rakers fine, nearly as long as the eye; there are about seventeen on the lower branch of the outer branchial arch. Origin of the dorsal fin somewhat behind that of the anal, and midway between the occiput and the root of the caudal. Ventral fins not longer than the eye. Serrature of abdomen not prominent; there are about eleven scutes behind the ventrals. Pectoral fins nearly as long as the head, without snout. A narrow silvery band along the side of the body.

West Indies.

a–d. Three and a half inches long. Jamaica. Purchased of Dr. Parnell.

e. Three and a half inches long. From the Haslar Collection.

Fourth Group. DUSSUMIERIINA.

Mouth anterior and lateral; upper jaw not overlapping the lower; abdomen neither keeled nor serrated; no osseous gular plate.

12. SPRATELLOIDES.

Spratelloides et Clupeoides, sp., *Bleeker.*

Body slightly compressed or subcylindrical, elongate. Abdomen obtuse, without keel or serrature. Scales of moderate size, deciduous; lateral line none. Snout compressed, formed as in *Clupea.* Teeth none, or minute and deciduous. Anal fin short; dorsal opposite to the ventrals. Gill-membranes separate, with about six short flat branchiostegals. Pseudobranchiæ well developed. Pyloric appendages in moderate number; stomach with a long blind sac. Ovaries closed, with oviducts.

Indian and Australian Seas (West Indies).

1. Spratelloides delicatulus.

Clupea delicatula, *Benn. Proc. Comm. Zool. Soc.* i. p. 168.
—— macassariensis, *Bleek. Journ. Ind. Archipel,* 1849, p. 72.
Clupeoides macassariensis, *Bleek. Verh. Bat. Gen.* xxiv. *Haring,* p. 17; or *Nat. Tydschr. Ned. Ind.* iii. p. 772.

B. 6. D. 11. A. 9. L. lat. 35.

The height of the body is one-sixth or rather more than one-sixth of the total length (without caudal), the length of the head one-fourth. Snout rather pointed, longer than the orbit, with the lower jaw slightly projecting beyond the upper. Maxillary rather broad, and extending to the vertical from the front margin of the orbit. Origin of the dorsal fin nearer to the end of the snout than to the root of the caudal; ventrals inserted below the posterior third of the dorsal fin. Back dark-coloured, sides and belly silvery, the two colours being sharply defined.

Indian ocean and archipelago; Australia.

a. Three inches long. East-Indian archipelago. From Dr. Bleeker's Collection.
b. Adult female, 3½ inches long. Australia. From J. MacGillivray's Collection.
c. Several adult specimens in a bad state. From the Haslar Collection.

2. Spratelloides alburnus.

Alosa alburnus, *Kner & Steindachner, Sitzgsber. Ak. Wiss. Wien,* 1866, October, liv. (publ. 1867,) fig. 16.

D. 11–12. A. 11–12. L. lat. 36. L. transv. 5.

The height of the body is one-fifth of the total length without caudal), the length of the head nearly one-fourth. The diameter of the eye is contained thrice and one-third in the length of the head, and is nearly equal to that of the snout. Jaws even in front; maxillary extending beyond the front margin of the orbit. Origin of the dorsal fin midway between the end of the snout and the root of the caudal (according to the figure nearer to the former!). Ventral fins inserted below the posterior half of the dorsal. Scales regularly arranged, firm, slightly striated. (*K. & St.*)

Valparaiso.

3. Spratelloides gracilis.

Clupea gracilis, *Schleg. Faun. Japon. Poiss.* p. 238, pl. 108. fig. 2.
—— argyrotænia, *Bleek. Journ. Ind. Arch.* 1849, p. 72.
Spratelloides argyrotænia, *Bleek. Verh. Bat. Gen.* xxiv. *Haring,* p. 29; or *Nat. Tydschr. Ned. Ind.* iii. p. 775.

D. 11. A. 13.

The height of the body is one-seventh of the total length (without caudal), the length of the head two-ninths. Snout pointed, much longer than the orbit, with the lower jaw scarcely projecting beyond the upper. Maxillary of moderate width, extending to the vertical from the front margin of the orbit. Origin of the dorsal fin nearer to the end of the snout than to the root of the caudal; ventrals inserted below the last dorsal rays. Body with a well-defined silvery band.

Japan; Celebes; Ternate.

a–c. Three and a half inches long. Japan.
d. Type of *Clupea argyrotænia.* East-Indian archipelago. From Dr. Bleeker's Collection.

The following species belongs, perhaps, to a distinct genus; but our specimens are in too bad a condition to decide upon their natural affinities:—

Clupea lamprotænia, *Gosse, Nat. Soj. Jam.* p. 291, pl. 1. fig. 2.

D. 14. A. 15.

The height of the body is one-sixth of the total length (without caudal), the length of the head rather more than one-fourth. Snout conical, as long as the eye, with the jaws even in front. Maxillary rather narrow, extending to below the front margin of the eye. Abdomen apparently slightly compressed. Some minute teeth in the jaws, along the vomer, and on the palatine bones. Gill-membranes entirely separate. Origin of the dorsal fin midway between the end of the snout and the root of the caudal fin. Ventrals inserted below the posterior half of the dorsal fin. Sides with a well-defined silvery band.

Jamaica.

a–b. Typical specimens, 2½ inches long. From Mr. Gosse's Collection.

13. DUSSUMIERIA.

Dussumieria, *Cuv. & Val.* xx. p. 467.

Body rather elongate, more or less compressed; abdomen not compressed or serrated. Scales of moderate size, very deciduous; lateral line none. Snout pointed; jaws and mouth formed as in *Clupea.* Jaws with small, but fixed, non-deciduous teeth; patches of villiform teeth on the palatine and pterygoid bones and on the tongue. Dorsal fin opposite to the ventrals; anal fin of moderate length. Gill-membranes entirely separate, with numerous very fine branchiostegals; pseudobranchiæ well developed. Pyloric appendages numerous.

East Indies.

1. Dussumieria acuta.

Cuv. & Val. xx. p. 467, pl. 606; *Cant. Mal. Fish.* p. 286; *Day, Fish. Malab.* p. 226.

B. 15. D. 18–20. A. 15–16. L. lat. ca 42.

Scales very deciduous. The height of the body is contained from thrice and three-fourths to four times and one-fourth in the total length (without caudal), the length of the head thrice and three-fourths or thrice and four-fifths. Snout pointed, longer than the orbit; lower jaw scarcely projecting beyond the upper; the maxillary is narrow and does not extend to the vertical from the front margin of the orbit. Origin of the dorsal fin midway between the root of the caudal and the anterior margin of the orbit. Ventral fins below the posterior half of the dorsal. Back dark-coloured, sides and belly silvery, the two colours being sharply defined.

East Indies.

a. Fine specimen, 6½ inches long. Sarawak. Presented by the Marquis Doria.
b. Adult, 5 inches long. Pinang. From Dr. Cantor's Collection.
c. Adult, skin. Pinang. From Dr. Cantor's Collection.

2. Dussumieria elopsoides.

Dussumieria elopsoides, *Bleek. Verh. Bat. Gen.* xxii. *Madura,* p. 12; xxiv. *Chiroc.* p. 12; or *Nat. Tydschr. Ned. Ind.* i. p. 421.
—— hasseltii, *Bleek. Verh. Bat. Gen.* xxiv. *Chiroc.* p. 13; or *Nat. Tydschr. Ned. Ind.* i. p. 422.

B. 15–19. D. 18–20. A. 15–16. L. lat. 52.

Scales very deciduous. The height of the body is one-fifth of the total length (without caudal), the length of the head one-fourth. Snout pointed, longer than the orbit; lower jaw scarcely projecting beyond the upper; the maxillary is narrow and does not extend to the vertical from the front margin of the orbit. Origin of the dorsal fin midway between the root of the caudal and the anterior or posterior margin of the orbit. Ventral fins below the posterior half of the dorsal. Back dark-coloured; sides and belly silvery, the two colours being sharply defined.

Indian and Chinese seas.

a. Adult, 6½ inches long. Java. From Dr. Bleeker's Collection.—Type of *D. hasseltii*.
b. Adult, 6 inches long. Java. From Dr. Bleeker's Collection.—Type of *D. elopsoides*.
c. Half-grown. Amboyna. Purchased of Mr. Frank.
d. Adult. Amoy. Purchased of Mr. Stevens.
e. Adult. From the Collection of the Zoological Society.

14. ETRUMEUS.

Etrumeus, *Bleek. Verh. Bat. Gen.* xxv. *Japan*, p. 48.

Body elongate, subcylindrical; abdomen not compressed or serrated. Scales of moderate size, very deciduous; lateral line none. Snout pointed; jaws and mouth formed as in *Clupea*, but with the supplementary bones of the maxillary very narrow. Jaws with small but fixed, non-deciduous teeth; patches of villiform teeth on the vomer, the palatine and pterygoid bones, and on the tongue. *Dorsal fin entirely in advance of the ventrals*; anal fin short. Gill-membranes entirely separate, with numerous fine branchiostegals; pseudobranchiæ well developed. Pyloric appendages numerous.

Japan; North Atlantic.

1. Etrumeus micropus.

Clupea micropus, *Schleg. Faun. Japon. Poiss.* p. 236, pl. 107. fig. 2.
Etrumeus micropus, *Bleek. Verh. Bat. Gen.* xxv. *Japan*, p. 48.

B. 15. D. 19. A. 9.

The height of the body is nearly one-sixth of the total length (without caudal), the length of the head one-fourth. Snout pointed, as long as the large eye, the diameter of which is two-sevenths of the length of the head. Lower jaw scarcely projecting beyond the upper; the maxillary is narrow, and extends to the vertical from the front margin of the eye. Origin of the dorsal fin much nearer to the end of the snout than to the root of the caudal. Back dark-coloured, sides and belly silvery.

Japan.

a. Six inches long. From Dr. Bleeker's Collection.

2. Etrumeus teres.

Alosa teres, *Dekay, New York Faun. Fish.* p. 262, pl. 40. fig. 128; *Baird, Ninth Rep. Smithson. Instit.* 1855, p. 349.
Dussumieria teres, *Brevoost, Narr. Exped. Japan*, ii. p. 279; *Gill, Proc. Acad. Nat. Sc. Philad.* 1860, p. 21.
Harengula teres, *Girard, Proc. Acad. Nat. Sc. Philad.* 1859, p. 158.

Beside the generic characters scarcely anything is known of this fish. It is stated to be without vomerine teeth; if this be really the case, this character in the generic diagnosis ought to be modified.

Atlantic coasts of the United States.

Fifth Group. ALBULINA.

Mouth inferior, of moderate width, toothed; upper jaw projecting beyond the lower; intermaxillary juxtaposed to the upper anterior edge of maxillary.

15. ALBULA.

Albula, *Gronov. Zoophyl.* p. 102.
Butyrinus, *Lacép.* v. p. 45.
Glossodus, (*Cuv.*) *Agassiz, in Spix, Pisc. Brasil.* p. 48.

Body oblong, moderately compressed; abdomen flat. Scales of moderate size, adherent; lateral line distinct. Eyes covered with a broad annular adipose membrane. Snout pointed; mouth inferior; intermaxillary short, maxillary forming the lateral part of the mouth. Bands of villiform teeth in the jaws, on the vomer and palatine bones; broad patches of coarse granular teeth on the sphenoid, pterygoid, and lingual bones. Dorsal fin opposite to ventrals; anal fin shorter than dorsal. Gill-membranes entirely separate, with numerous branchiostegals; pseudobranchiæ well developed. Pyloric appendages numerous.

Tropical and subtropical seas.

1. Albula conorhynchus.

Vubarana, *Piso, Hist. Nat. Ind.* iii. p. 63.
Amia, *Brown, Jamaica,* p. 442. no. 2.
Bantam, *Renard,* i. tab. 34. fig. 184.
Macabi, *Parra,* p. 88, tab. 35.
Conorhynchus, *Nozeman, in Act. Select.* iii. p. 382, tab. 9.
Albula, sp., *Gronov. Zoophyl.* p. 102. no. 327.
Argentina glossodonta, *Forsk. Descr. An.* p. 68; *Lacép.* v. p. 366.
Albula conorhynchus, *Bl. Schn.* p. 432.
—— plumieri, *Bl. Schn.* tab. 86.
Clupea brasiliensis, *Bl. Schn.* p. 427.
Amia immaculata, *Bl. Schn.* p. 451.
Synodus argenteus, *Bl. Schn.* p. 398.
Clupea macrocephala, *Lacép.* v. pp. 426, 460, pl. 14. fig. 1.
Butyrinus banana, *Lacép.* v. p. 46.
Synodus vulpes, *Lacép.* v. p. 321, pl. 8. fig. 2.
On "Argentina glossodonta," *Cuv. Mém. Mus.* v. p. 371.
Esox argenteus, *Forst. Descript. An.* ed. *Lichtenstein,* p. 196; *Bl. Schn.* p. 395.
Engraulis sericus, *Spix, Pisc. Bras.* tab. 23. fig. 2.
—— bahiensis, *Spix, l. c.* tab. 24. fig. 2.
Glossodus forskalii, *Agass. in Spix, l. c.* p. 49.
Butirinus glossodontus, *Rüpp. N. W. Fische,* p. 80, taf. 20. fig. 3; *Schleg. Faun. Japon. Poiss.* p. 242, tab. 109. fig. 1.
Albula macrocephala, *Cuv. & Val.* xix. p. 324.
—— parræ, *Cuv. & Val.* xix. p. 339.
—— goreensis, *Cuv. & Val.* xix. p. 342.

Albula bananus, *Cuv. & Val.* xix. p. 345; *Bleek. Verh. Bat. Gen.* xxiv. *Chiroc.* p. 11.
—— neoguinaica, *Cuv. & Val.* xix. p. 350.
—— seminuda, *Cuv. & Val.* xix. p. 351.
—— erythrocheilos, *Cuv. & Val.* xix. p. 352, pl. 540 (574); *Cant. Mal. Fish.* p. 283.
—— forsteri, *Cuv. & Val.* xix. p. 354.
—— rostrata, *Gronov. Syst.* ed. *Gray,* p. 189.

B. 11–16. D. 17–18. A. 8. L. lat. 75. L. transv. $\frac{9-8}{11-9}$.
Vert. 67–70 (41/26). Cæc. pyl. 22.

The length of the head is two-sevenths or one-fourth of the total (without caudal); snout tetrahedral, conical; mouth inferior. Ventral fins inserted below the last dorsal rays. Uniform silvery.

Tropical and subtropical seas.

a. Adult. Cape Verde Islands. Presented by the Rev. R. T. Lowe.
b–c. Adult and half-grown: stuffed. West Indies. Purchased of Mr. Scrivener.
d–f. Adult and young: skins. Jamaica. Purchased of Dr. Parnell.
g. Adult. Puerto Cabello. Purchased of Mr. Brandt.
h. Adult. Belize. From Mr. Godman's Collection.
i–k. Young. Bahia. From Dr. Wucherer's Collection.
l. Half-grown. Pacific coast of Central America. Presented by Capt. J. M. Dow.
m. Young: skin. Tana, New Hebrides. Voyage of the 'Herald.'
n, o. Young. East-Indian archipelago. Purchased of Mr. Frank.
p–r. Young: skins. Pinang. From Dr. Cantor's Collection.
s. Adult: stuffed. Singapore. Purchased of Mr. Stevens.
t. Adult: skin. Ceylon. From Dr. Kelaart's Collection.
u. Adult. Port Natal. Purchased of Mr. Thomas Ayres.
v. Adult: skin. Zanzibar. From Lieut.-Col. Playfair's Collection.
w. Adult: stuffed. Red Sea.
x. Half-grown. Red Sea.
y, z, α, β, γ–ε. Adult, half-grown, and young.

Sixth Group. ELOPINA.

Upper jaw shorter than lower; abdomen rounded; an osseous gular plate.

16. ELOPS.

Elops, *L. Syst. Nat.* i. p. 518.

Body rather elongate, moderately compressed; abdomen flat. Scales small, adherent; lateral line distinct. A narrow osseous lamella attached to the mandibulary symphysis, covers the part between the mandibles. Snout pointed, mouth wide, anterior: intermaxillary short, maxillary forming the lateral part of the mouth. Bands of villiform teeth in the jaws, on the vomer, palatine and pterygoid bones, on the tongue, and on the base of the skull. Dorsal fin opposite to ventrals; anal rather shorter than dorsal. Gill-membranes entirely separate, with very numerous branchiostegals. Pseudobranchiæ well developed. Pyloric appendages numerous.

Tropical and subtropical seas.

1. Elops saurus.

Sloane, Jamaica, ii. p. 284, pl. 250. fig. 1.
? Harengus minor, *Catesby*, ii. p. 24.
Elops saurus, *L. Syst. Nat.* i. p. 518; *Bloch*, tab. 393. fig. 1; *Bl. Schn.* p. 430, tab. 82; *Dekay, New York Fauna, Fish.* p. 267, pl. 41. f. 131; *Cuv. & Val.* xix. p. 365; *Cant. Mal. Fish.* p. 287; *Bleek. Verh. Bat. Gen.* xxiv. *Haring*, p. 14; *Gronov. Syst.* ed. *Gray*, p. 168; *Kner, Novara, Fisch.* p. 338.
Argentina carolina, *L. Syst. Nat.* i. p. 519.
Argentina machnata, *Forsk. Descr. An.* p. 68.
Mugilomorus annæ carolinæ, *Lacep.* v. p. 398.
Russell, pl. 179.
Elops inermis, *Mitchill, Lit. & Phil. Trans. New York* i. p. 445.
Elops machnata, *Rüpp. N. W. Fische*, p. 80; *Richards. Voy. Ereb. & Terr. Fish.* p. 59, pl. 36. figs. 3-5; and *Ichth. Chin.* p. 311; *Schleg. Faun. Japon. Poiss.* p. 241, pl. 109. fig. 2; *Günth. Fish. Zanz.* p. 121.
—— purpurascens, *Richards. Ichth. Chin.* p. 311.
—— capensis, *Smith, Ill. Zool. S. Afr. Pisc.* pl. 7.

B. 29–35. D. 23–24. A. 15–17. V. 14–15. L. lat. 108. L. transv. 13/15. Vert. 62 (*Rüpp.*), 72 (*Val.*), 51 32 (*Hyrtl*).

The length of the head is one-fourth of the total length (without caudal) and much more than the height of the body. Lower jaw scarcely projecting beyond the upper. Maxillary extending far behind the orbit; cheek covered by the dilated posterior part of the suborbital ring. Uniform silvery.

Tropical and subtropical seas.

a. Half-grown. Cuba. From the Collection of the Zoological Society.
b–c. Adult: skins. Jamaica. Purchased of Dr. Parnell.
d. Young. St. Croix. Purchased of Mr. Stevens.
e. Young. South America. Presented by Sir R. Schomburgk.
f. Half-grown: stuffed. Cape of Good Hope. Presented by Sir A. Smith.
g. Forty-five inches long: stuffed. Zanzibar. From the Collection of Lieut.-Col. Playfair.
h. Half-grown: skin. Zanzibar. From the Collection of Lieut.-Col. Playfair.
i–k. Half-grown: skins. East Africa. Presented by Dr. Kirk.
l. Half-grown: stuffed. Djedda.
m. Half-grown: skin. Pinang. From Dr. Cantor's Collection.
n. Adult: stuffed. China. Presented by J. R. Reeves, Esq.
o. Adult: skin. From Gronow's Collection.

2. Elops lacerta.

Cuv. & Val. xix. p. 381, pl. 575.

B. 25–26. D. 20. A. 17.

Scales larger than in the first species. Top of dorsal and anal fins blackish. (*Val.*)

Senegal.

17. MEGALOPS.

Megalops, (*Commers.*) *Lacép.* v. p. 289.

Body oblong, compressed; abdomen flat. Scales large, adherent; lateral line distinct. A narrow osseous lamella, attached to the mandibulary symphysis, between the mandibles. Snout obtusely conical; mouth anterior, lower jaw prominent; intermaxillary short, maxillary forming the lateral part of the mouth. Bands of villiform teeth in the jaws, on the vomer, palatine and pterygoid bones, on the tongue, and on the base of the skull. Dorsal fin opposite to, or immediately behind, the ventrals; anal rather longer than dorsal. Gill-membranes entirely separate, with numerous branchiostegals. Pseudobranchiæ none. Pyloric appendages numerous.

Tropical seas, entering fresh waters.

Although I have taken great pains to refer the numerous examples in the British Museum to the species recently proposed by Dr. Bleeker (of which we possess typical examples), the majority of them either proved to be intermediate forms, or exhibited characters which would render necessary the establishing of many more such species. However, I convinced myself that the Indian *Megalops* shows as many slight variations as any other species of a similarly wide geographical range; and experience has shown the failure of all these attempts to introduce such variations permanently into science as species.

1. Megalops cyprinoides.

Clupea cyprinoides, *Brouss. Dec. Ichthyol.* i. tab. 9 (not synon.); *Bonnat. Encycl. Méth. Ichth.* p. 187, pl. 75. fig. 314 (cop. *Brouss.*); *Lacép.* v. pl. 13. fig. 3; *Forster, Descr. Anim.* ed. *Licht.* p. 296.
Megalops filamentosus, *Lacép.* v. pp. 289, 290, tab. 13. fig. 3; *Bleek. Ned. Tydschr. Dierk.* iii. 1866, p. 286.
Kundinga, *Russell,* ii. p. 81, pl. 203.
Cyprinodon cundinga, *Ham. Buch. Fish. Gang.* pp. 254, 383.
Megalops setipinnis, *Richards. Ann. Nat. Hist* xi. p. 493; and *Ichth. Chin.* p. 310.
—— curtifilis, *Richards. Ichth. Chin.* p. 310.
—— indicus, *Cuv. & Val.* xix. p. 388, pl. 542; *Bleek. Verh. Bat. Gen.* xxiv. *Chiroc.* p. 15; *Kner, Novara, Fisch.* p. 339.
Elops cundinga, *Cant. Mal. Fish.* p. 289.
Megalops macrophthalmus, *Bleek. l. c.*
Megalops macropterus, *Bleek. Ned. Tydschr. Dierk.* iii. 1866, p. 284.
—— kundinga, *Bleek. l. c.* p. 288.
—— cyprinoides, *Bleek. l. c.* p. 290.
—— oligolepis, *Bleek. l. c.* p. 292.
Elops apalike, *Day, Fish. Malab.* p. 228.

B. 23–26. D. 17–20. A. 24–27. L. lat. 37–42. Vert. 28/29.

Ventral fin inserted below the origin of the dorsal; maxillary extending to below, or even somewhat behind, the posterior part of the orbit.

From the east coast of Africa to Polynesia and Australia; entering fresh waters.

a, a'. Half-grown. Zanzibar.
b. Half-grown: skin. Zanzibar. From Lieut.-Col. Playfair's Collection.
c. Half-grown: skin. River Shire. Presented by Dr. Kirk.
d–g. Half-grown. Madras. Presented by Capt Mitchell.
h–i. Young. Bengal. Presented by G. R. Waterhouse, Esq.
k–l. Half-grown: skins. Pinang. From Dr. Cantor's Collection.
m. Half-grown. Pinang. From Dr. Cantor's Collection.
n. Young: skin. Pinang. From Dr. Cantor's Collection.—This specimen has thirty-seven scales in the lateral line, and not twenty-nine as stated by Cantor.—Type of *M. oligolepis*, Blkr.
o. Half-grown. Sumatra.
p. Half-grown. Java. From Dr. Bleeker's Collection as *M. kundinga*.
q–r. Half-grown and young. Amboyna. Purchased of Hr. Frank.
s. Half-grown. East-Indian archipelago. From Dr. Bleeker's Collection as *M. macropterus*.
t. Half-grown. East-Indian archipelago. From Dr. Bleeker's Collection as *M. cyprinoides*.
u. Half-grown. East-Indian archipelago. From Dr. Bleeker's Collection as *M. filamentosus*.
v. Half-grown. Formosa. From Consul Swinhoe's Collection.
w. Half-grown: skin. Aneiteum. From Mr. MacGillivray's Collection.
x, y, z–α. Half-grown and young. Cape York, North Australia.
β, γ. Half-grown. Port Essington.
δ–ε. Half-grown: skins. Freshwater swamp near Victoria; Port Essington.
ζ. Half-grown. Old Collection.
η–ι. Young. From the Haslar Collection.

2. Megalops thrissoides.

Camaripucuagu, *Marcgr. Bras.* p. 179; *Pison.* p. 65; *Jonston*, p. 196, tab. 35. fig. 10; *Willughby*, p. 230, tab. P. 6. fig. 1; *Ruysch, Hist. Pisc.* p. 137, tab. 35. fig. 10.
Clupea cyprinoides, *Bl.* ix. p. 32 (part.), tab. 403; *Lacép.* v. pp. 424, 461.
—— thrissoides, *Bl. Schn.* p. 424 (part.).
—— apalike, *Lacép.* v. pp. 425, 461.
—— gigantea, *Shaw, Zool.* v. 1. p. 173.
Megalops atlanticus, *Cuv. & Val.* xix. p. 398.
—— giganteus, *Bleek. Ned. Tydschr. Dierk.* iii. 1866, p. 282.

B. 22–24. D. 14–16. A. 22–24. L. lat. 42–45.

Ventral fin conspicuously in advance of the origin of the dorsal; maxillary generally extending beyond the orbit.

Atlantic, entering fresh waters.

a. Sixty-two inches long: stuffed. Old Collection.
b–c. Adult and half-grown: skins. Jamaica. Purchased of Dr. Parnell.
d. Half-grown: skin. Cuba. From the Collection of the Zoological Society.
e. Half-grown: skin. Trinidad. Presented by J. B. Richardson, Esq.
f. Young. Demerara. Presented by Dr. Hancock.
g. Half-grown. Purchased of Mr. Brandt.

Seventh Group. CHANINA.

Mouth small, anterior, transverse. No teeth. Intermaxillary in juxtaposition to the upper anterior edge of maxillary; abdomen flat; gill-membranes entirely united.

18. CHANOS.

Chanos, *Lacép.* v. p. 395.
Lutodeira, *Kuhl, Rüppell.*

Body oblong, compressed; abdomen flat. Scales small, striated, adherent; lateral line distinct. Snout depressed; mouth small, anterior, transverse, the lower jaw with a small symphysial tubercle. Intermaxillary in juxtaposition to the upper anterior edge of the maxillary. Teeth none. Dorsal fin opposite to the ventrals; anal small, shorter than dorsal; caudal deeply forked. Gill-membranes entirely united below, and free from the isthmus. Branchiostegals four, long. Pseudobranchiæ well developed. An accessory branchial organ in a cavity behind the gill-cavity proper. Air-bladder divided by a constriction into an anterior and posterior portion. Mucous membrane of the œsophagus raised into a spiral fold. Pyloric appendages numerous; intestine with many convolutions.

Indian and Pacific Oceans.

On the accessory branchial organ and the skeleton see Hyrtl, Denkschr. Ak. Wiss. Wien, xxi. 1863, p. 1.

1. Chanos salmoneus.

Renard, Poiss. d'Amb. fol. 34. no. 184.
Mugil chanos, *Forsk. Descr. An.* p. 74; *Bl. Schn.* p. 116.
—— salmoneus, *(Forst.) Bl. Schn.* p. 121; *Forst. Descr. Anim.* ed. *Lichtenstein,* p. 299.
Chanos arabicus, *Lacép.* v. p. 396; *Cuv. & Val.* xix. p. 187.
Palah bontah, *Russell,* ii. pl. 207.
Tooleloo, *Russell,* ii. pl. 208.
Cyprinus (Leuciscus) palah, *Cuv. Règne Anim.*
—— tolo, *Cuv. Règne Anim.*
Leuciscus zeylonicus, *Benn. Proc. Comm. Zool. Soc.* 1832, p. 184.
Lutodeira chanos, *(Kuhl) Rüpp. N. W. Fische,* p. 18, tab. 5. fig. 1; *Günth. in Fish. Zanz.* p. 120.

Leuciscus (Ptycholepis) salmoneus, *Gray, in Dieffenbach, Travels in New Zealand*, ii. p. 218.

Butirinus maderaspatensis, *Jerdon, Madr. Journ. Lit. & Sc.* xv. p. 344.

Lutodeira salmonea, *Richards. Voy. Ereb. & Terr. Ichthyol.* p. 58, pl. 36. fig. 1.

Chanos mento, *Cuv. & Val.* xix. p. 194.

—— chloropterus, *Cuv. & Val.* xix. p. 195; *Kner, Novara, Fisch.* p. 341.

—— nuchalis, *Cuv. & Val.* xix. p. 196.

—— orientalis, *Cuv. & Val.* xix. p. 197; *Kner, l. c.*

—— cyprinella, *Cuv. & Val.* xix. p. 198.

—— salmoneus, *Cuv. & Val.* xix. p. 201.

—— pala, *Cant. Mal. Fish.* p. 278; *Day, Fish. Malab.* p. 224.

—— tolo, *Cant. l. c.* p. 282.

—— indicus, *Bleek. Verh. Bat. Gen.* xxiv. *Chiroc.* p. 11.

B. 4. D. 13–17. A. 9–10. L. lat. 85–88. L. transv. 13/16. Vert. 19/26.

Uniform silvery.

Indian and Pacific Oceans.

a. Half-grown: stuffed. Red Sea. Purchased of Dr. Rüppell.
b. Adult: stuffed. Zanzibar. Purchased of Lieut.-Col. Playfair.
c. Half-grown. Seychelles. Presented by Lieut.-Col. Playfair.
d. Young. Ceylon. From the Collection of the Zoological Society. —Type of *Leuciscus zeylonicus*, Benn.
e–f. Adult and young: skins. Pinang. From Dr. Cantor's Collection.
g. Young: skin. Pinang. From Dr. Cantor's Collection as *Chanos tolo*.
h–k. Half-grown and young. Formosa. From Consul Swinhoe's Collection.
l–n. Young. Cape York. Purchased of Mr. Higgins.
o–p. Half-grown: skins. Port Essington.
q–r. Fine specimens. Chiapam. From Mr. Salvin's Collection.
s, t. Fine specimens. ? Pacific coast of Central America. From the Haslar Collection.
u–v. Adult: stuffed.

2. Chanos lubina.

Cuv. & Val. xix. p. 199, pl. 567.

D. 19. A. 15. L. lat. 90.

Uniform silvery.

Booroo; Seychelles; Mauritius.

Fam. 22. CHIROCENTRIDÆ.

Chirocentridæ, *Cuv. & Val.* xix. p. 153.

Body covered with thin, deciduous scales; barbels none. Margin of the upper jaw formed by the intermaxillaries mesially, and by the maxillaries laterally, both bones being firmly united by juxtaposition. Opercular apparatus complete. Adipose fin none; the dorsal fin belongs to the caudal portion of the vertebral column. Stomach with a blind sac; intestine short, the mucous membrane forming a spiral fold; pyloric appendages none. Pseudobranchiæ none; air-bladder incompletely divided into cells; gill-opening wide.

Indian Ocean and Archipelago.

Only one genus is known.

1. CHIROCENTRUS.

Chirocentrus, *Cuv. Règne Anim.*

Body elongate, compressed, with the abdomen trenchant; cleft of the mouth wide, oblique, with the lower jaw prominent. Lower jaw with a series of large canine teeth; intermaxillary with a pair of horizontal canines. Narrow bands of minute teeth on the palatine and pterygoid bones and on the tongue. Dorsal fin short, opposite to the anal, which is long. A long pointed osseous appendage at the base of the pectoral; ventral fins very small. Gill-membranes united for a short distance, with eight branchiostegals.

From the eastern coasts of Africa to China.

1. Chirocentrus dorab.

Clupea dorab, *Forsk. Descr. An.* p. 72; *Lacép.* v. p. 425; *Russell,* ii. pl. 199.
—— dentex, *Bl. Schn.* p. 428.
Esox chirocéntrus, *Lacép.* v. p. 296.
Chirocentrus dorab, *Cuv. Règne Anim.*; *Rüpp. N. W. Fische,* p. 81; *Richards. Ichthyol. Chin.* p. 311; *Cuv. & Val.* xix. p. 150, pl. 565; *Bleek. Verh. Bat. Gen.* xxii. *Madura,* p. 6; *Cant. Mal. Fish.* p. 277; *Day, Fish. Malab.* p. 223.
—— hypselosoma, *Bleek. Verh. Bat. Gen.* xxiv. *Chiroc.* p. 25; or *Nat. Tydschr. Ned. Ind.* iii. p. 71.

B. 8. D. 16–17. A. 33–34. V. 7. Vert. 29/46.

The height of the body is less than the length of the head, which is about two-elevenths of the total (without caudal). Coloration uniform.

Indian ocean and archipelago; Chinese and Japanese seas.

a. Adult: stuffed. Zanzibar. From Lieut.-Col. Playfair's Collection.
b–c. Fine specimens. Port Natal. Purchased of Mr. Th. Ayres.
d, e. Adult and half-grown. Bengal. Presented by G. R. Waterhouse, Esq.
f. Half-grown: skin. Pinang. From Dr. Cantor's Collection.
g. Half-grown. Amboyna. Purchased of Mr. Frank.
h. Adult. East-Indian archipelago. From Dr. Bleeker's Collection as *Chiroc. hypselosoma*.
i. Adult. Old Collection.
k. Half-grown. China. Presented by J. R. Reeves, Esq.
l. Adult. Japan. Purchased of Mr. Jamrach.
m. Adult: skeleton. Japan. Purchased of Mr. Jamrach.

Fam. 23. ALEPOCEPHALIDÆ.

Body covered with thin cycloid scales; head naked; barbels none. Margin of the upper jaw formed by the intermaxillaries and maxillaries, the former being placed along the upper anterior edge of the latter. Opercular apparatus complete. Adipose fin none; the dorsal fin belongs to the caudal portion of the vertebral column. Stomach curved, without blind sac; pyloric appendages in moderate number. Pseudobranchiæ; air-bladder absent. Gill-openings very wide.

Mediterranean, deep-sea fishes.

One genus only is known.

1. ALEPOCEPHALUS.

Alepocephalus, *Risso, Mem. Acad. Sc. Turin*, xxv. 1820, p. 270; *Müll. Abhandl. Ak. Wiss. Berl.* 1846, p. 171; *Cuv. & Val.* xix. p. 169.

Body oblong, compressed; cleft of the mouth of moderate width, with the jaws nearly even in front; a series of small teeth in the intermaxillaries, mandibles, and on the palatine bones. Dorsal and anal fins subequal in length, opposite to each other; caudal emarginate. Bones thin. Gill-membranes entirely separate, with six branchiostegals.

Mediterranean.

1. Alepocephalus rostratus.

Risso, l. c. p. 271, pl. 10. fig. 4; *Cuv. & Val.* xix. p. 172, pl. 566.

B. 6. D. 16. A. 18. L. lat. 55. Cæc. pyl. 12.

The height of the body is less than the length of the head, which is nearly two-sevenths of the total (without caudal). Eye very large. Blackish brown; inside of mouth and abdominal cavity black.

Mediterranean.

a. Not in good state. Purchased of Mr. Cutter.

Fam. 24. NOTOPTERIDÆ.

Notoptères, *Cuv. & Val.* xix. p. 129.

Head and body scaly; barbels none. Margin of the upper jaw formed by the intermaxillaries mesially, and by the maxillaries laterally. Opercular apparatus incomplete. Tail prolonged, tapering. Adipose fin none. Dorsal short, belonging to the caudal portion of the vertebral column; anal very long. Stomach without blind sac; two pyloric appendages. Pseudobranchiæ none; air-bladder present, divided in the interior. The ova fall into the cavity of the abdomen before exclusion. On each side a parieto-mastoid cavity leading into the interior of the skull.

Fresh waters of the East Indies and West Africa.

1. NOTOPTERUS.

Notopterus, sp., *Lacép.* ii. p. 189.
Notopterus, *Cuv. & Val.* xxi. p. 119.

Body much compressed, tail elongate and tapering. Abdomen with a double serrature. Scales very small, lateral line distinct; system of the muciferous channels of the head well developed. Snout obtuse, convex; cleft of the mouth of moderate width, lateral. Maxillary articulated to the intermaxillary, and formed of a single bone. Both jaws with a narrow band or series of small teeth, unequal in size; bands of teeth on the vomer, palatine, and pterygoid bones, and on the sphenoid; two series of teeth on the tongue. Some of the bones of the head, especially the lower limb of the præoperculum, serrated. Anal fin extremely long, and united with the caudal. Dorsal fin very short, in the middle of the length of the fish, or entirely absent. Ventral fins none, or rudimental, united, immediately before the vent. Gill-membranes partly united, with 6–9 branchiostegals. Air-bladder with several divisions in its interior and terminating in two horns anteriorly and posteriorly, the anterior horns being in immediate connexion with the auditory organ. Suboperculum absent.

Fresh waters of the East Indies and of West Africa.

Valenciennes (*l. c.*) has given a most excellent description of the anatomy of this genus.

We divide this genus into two very well-marked subgenera, which may rank as genera if the second should prove to contain more than one species:—

a. A dorsal fin. Union of the gill-membranes narrow; branchiostegals from six to nine: *Notopterus*, p. 479.

β. No dorsal fin. Union of the gill-membranes broader; branchiostegals three: *Xenomystus*, p. 481.

a. Notopterus.

1. Notopterus chitala.

Mystus chitala, *Ham. Buch. Fish. Gang.* pp. 236, 382; *Gray, Ind. Zool.* c. fig.
Notopterus ornatus, *Gray, Zool. Misc.* p. 16.
—— chitala, *Gray, l. c.*
—— maculatus, *Valenc. in Bélang. Voy. Ind. Poiss.* pl. 5. fig. 2.
—— buchanani, *Cuv. & Val.* xxi. p. 148.
—— hypselonotus, *Bleek. Verh. Bat. Gen.* xxiv. *Chir.* p. 27; or *Nat. Tydschr. Ned. Ind.* iii. p. 604; and *Act. Ac. Cæs. Leop.-Carol.* xxiv. 1. *Notopt.* p. 55, tab. 9.
—— lopis, *Bleek. l. c.* 1°, or *l. c.* 2°, i. p. 423; and *l. c.* 3°. p. 60, tab. 10.

B. 8–9. D. 9–10. A. 110–125.

Upper profile of the head concave, its facial portion being produced; the maxillary extends behind the orbit. Coloration uniform, or with indistinct, irregular, darker cross bands, or with some round, black, ocellated spots along the lower part of the tail.

East Indies.

a–d. Adult (35 inches long) and half-grown: stuffed. East India.
e–f. Half-grown. Siam. Purchased of Mr. Jamrach.
g. Adult. East-Indian archipelago. From Dr. Bleeker's Collection as type of *N. lopis*.
h. Adult. East-Indian archipelago. From Dr. Bleeker's Collection as type of *N. hypselonotus*.

2. Notopterus borneensis.

Notopterus borneensis, *Bleek. Verh. Bat. Gen.* xxiv. *Chiroc.* p. 26; or *Nat. Tydschr. Ned. Ind.* ii. p. 437; and *N. Act. Acad. Cæs. Leop.-Carol.* xxiv. 1. *Notopt.* p. 57, tab. 7.
—— maculosus, *Bleek. l. c.* 1° et 2°; *l. c.* 3°, p. 58, tab. 8.

B. 8. D. 10. A. 125.

Upper profile of the head distinctly concave; the maxillary extends to below the posterior half of the orbit. The bones of the lower side of the head finely serrated. Coloration uniform, or with small, round, blackish spots on and above the anal fin.

Borneo and Sumatra.

a. Nine inches long. Borneo. From Dr. Bleeker's Collection.—Type of *N. borneensis*.
b. Nine inches long. Borneo. From Dr. Bleeker's Collection.—Type of *N. maculosus*.

3. Notopterus kapirat.

? Tinca marina s. hippurus, *Bontius, Hist. Nat. Ind.* p. 78.
Gymnotus notopterus, *Pall. Spicil. Zool.* vii. p. 40, tab. 6. fig. 2; cop. by *Bonnaterre, Encycl.* p. 37, pl. 25. fig. 83.
Notopterus kapirat, *Lacép.* ii. p. 190; *Valenc. in Bélang. Voy. Ind. Zool.* p. 391, pl. 5. fig. 1; *Bleek. Act. Ac. Cæs. Leop.-Carol.* xxiv. 1. *Notopt.* p. 55, tab. 6.
Clupea synura, *Bl. Schn.* p. 426.
Mystus kapirat, *Ham. Buch. Fish. Gang.* p. 235; *Gray, Ind. Zool.* c. fig.
—— badgee, *Sykes, Trans. Zool. Soc.* ii. p. 376, tab. 67. fig. 2.
Notopterus pallasii, *Cuv. & Val.* xxi. p. 130.
—— bontianus, *Cuv. & Val.* xxi. p. 147, pl. 613; *Bleek. Verh. Bat. Gen.* xxiv. *Chiroc.* p. 17; or *Nat. Tydschr. Ned. Ind.* i. 1850, p. 423.

B. 7–8. D. 8–9. A. 100–110. Vert. 70–72.

Upper profile of the head not, or scarcely, concave; the maxillary extends to below the middle of the orbit. The bones on the lower side of the head finely serrated. Coloration uniform.

East Indies.

a. Many half-grown and young examples. Madras. Presented by Capt. Mitchell.
b. Young. Nilgherries. Purchased of Surgeon Day.
c. Adult. Dekkan. From Col. Sykes's Collection.
d. Adult: stuffed. Loodianah. From the Collection of the East-India Company.
e–f. Adult: skins. Poonah. Presented by Lieut.-Col. Playfair.
g. Adult. Calcutta. Presented by G. R. Waterhouse, Esq.
h–i. Adult and half-grown: stuffed. Bengal. Presented by G. R. Waterhouse, Esq.
k, l. Young. Assam. From the Collection of the East-India Company.
m–o. Half-grown and young. Cachar. Presented by Lieut.-Col. Playfair.
p. Adult. Siam. Purchased of Mr. Jamrach.
q. Half-grown. East India. From the Collection of the East-India Company.
r. Many adult and half-grown specimens: stuffed. East India.
s. Adult. East-Indian archipelago. From Dr. Bleeker's Collection.
t. Adult. India. Presented by J. R. Reeves, Esq.

4. Notopterus afer.

B. 8. D. 5. A. 116. C. 14. V. 0.

The height of the body is nearly equal to the length of the head, which is contained five times and a half in the total (with the caudal). *Upper profile of the head straight or a little convex.* The diameter of the eye is a little more than the length of the snout, and one-fifth of that of the head. *The maxillary extends nearly to the vertical from the hind margin of the orbit.* Teeth in the jaws in a single series; palatine teeth in an oblong band, the outer being strongest, forming a series like the maxillary teeth. *None of the* *bones of the head are serrated, except the intero-inferior edge of the præoperculum.* Nasal appendage very distinct.

There are nine stout gill-rakers along the lower branch of the outer branchial arch. Forty pairs of spines along the abdomen. *No trace of ventrals.* Dorsal fin considerably nearer to the end of the snout than to that of the tail, opposite to the twenty-fourth anal ray. Pectoral fin extending to or a little beyond the origin of the anal fin. Scales very small. Uniform brown, or brownish black, sometimes with more or less numerous light-reddish spots.

West Africa.

a–b. Half-grown fine specimens. Sierra Leone. Purchased of Mr. Stevens.

c, *d*. Adult (18 inches long) and half-grown. West Africa.

e–f. Half-grown: skins. West Africa. Purchased of Mr. Dalton.

β. *Xenomystus.*

5. Notopterus nigri.

B. 3. D. 0. A+C. 113.

The height of the body is contained four times and a half in the total length (with the caudal), the length of the head six times and two-thirds. Upper profile of the head and neck slightly convex. The diameter of the eye is more than the length of the snout, and two-sevenths of that of the head. The maxillary does not extend to below the middle of the orbit. Teeth in the jaws in a single series; palatine and sphenoid teeth in an extremely narrow band. Nasal appendages rather long, forming a pair of barbels as long as the snout. Suborbital ring and lower edges of the mandible and præoperculum serrated. Gill-membranes rather broadly united. Twenty-one pairs of spines along the abdomen. Ventral fins extremely small. Pectoral fins nearly as long as the head, reaching far beyond the origin of the anal fin. Scales very small. Uniform brown.

River Niger.

a. Six inches long. From Mr. Fraser's Collection.

Fam. 25. HALOSAURIDÆ.

Body covered with cycloid scales; head scaly; barbels none. Margin of the upper jaw formed by the intermaxillaries mesially, and by the maxillaries laterally. Opercular apparatus incomplete. Adipose fin none. The short dorsal belongs to the abdominal part of the vertebral column; anal very long. Stomach with a blind sac; intestine short; pyloric appendages in moderate number. Pseudobranchiæ none; air-bladder large, simple; gill-openings wide. Ovaries closed.

Atlantic, deep-sea fishes.

1. HALOSAURUS.

Halosaurus, *Johnson*, *Proc. Zool. Soc.* 1863, p. 406.

Body elongate, compressed, terminating in an exceedingly long, tapering tail; abdomen rounded. Snout much projecting beyond the mouth, which is inferior, of moderate width. Facial bones with large muciferous cavities. Præoperculum produced behind into a long flat process, replacing the sub- and interoperculum. Eye large. Teeth in villiform bands in the jaws, vomer, and palatine bones, and on the tongue. Dorsal fin short, opposite to the space between ventrals and vent. Anal fin exceedingly long, occupying the entire length of the tail to its point; no caudal fin. Pectoral inserted high up the side, without basal appendage. Lateral line running near to the lower profile. Gill-membranes entirely separate, with numerous branchiostegals.

Atlantic.

1. **Halosaurus owenii.**

Johnson, *l. c.* pl. 36. fig. 2.

B. 14. D. 11. A. 191. P. 11. V. 10. L. lat. 170.
L. transv. 14/6.

The height of the body equals the length of the head, without snout; the length of the head is equal to its distance from the ventrals, and two-fifths of that from the vent. There is only one ($1\frac{1}{2}$) series of scales between the lateral line and ventral fin. Coloration uniform.

Madeira.

a. Fine specimen, type of the species. Presented by J. Y. Johnson, Esq.

ADDENDA.

Page 7.

In the diagnosis of *Ceratichthys*, read "*Barbels two or none,*" instead of "*Barbels two.*"

Page 9.

Add to the "Synopsis of the genera," after **Meda**:—

Pharyngeal teeth rudimental, replaced by a ridge of the bone ... 60 *a*. GRAODUS.

Page 18. **Catostomus duquesnii.**

We have received from Mr. Cope two small examples from the Roanoke River, with the name of *Ptychostomus cervinus* (Cope): I do not regard them as distinct from *C. duquesnii*, although they appear to have a smaller head, the length of which is one-fifth of the total (without caudal).

Page 55. **Labio rohita.**

n. Thirty-two inches long: skin. Calcutta. From Dr. Falconer's Collection.

Page 108. **Barbus trispilus.**

Prof. Peters informs me that this fish is identical with *Barbus trimaculatus* (p. 106), which was not apparent from the description and figures.

Page 116. Add a new species:—

71 *a*. **Barbus collingwoodii.**

D. 11. A. 8. L. lat. 30–32. L. transv. 6/4½.

The osseous dorsal ray is strong, coarsely serrated behind, its stiff portion being two-thirds as long as the head. There are two or two and a half series of scales between the lateral line and the root of the ventral fin. Body strongly compressed, scarcely elevated, with the profile of the back slightly arched; its depth is one-fourth of the total length (without caudal); head broad, its length being a little less than one-fourth of the total (without caudal); interorbital space flattish; snout short, obtuse, as long as the diameter of the eye, which is two-sevenths of the length of the head, and situated immediately below the upper profile of the head; barbels of moderate length, about as long as the eye. The origin of the dorsal fin is behind that of the ventrals, and somewhat nearer to the root of the caudal than to the end of the snout. Caudal fin with a broad black marginal band above and below.

Borneo.

a. Six inches long. Sarawak. Presented by Dr. C. Collingwood.

Page 132. **Barbus douronensis.**

e. Half-grown. Sarawak. Presented by Dr. Collingwood.

Page 140.

Barbus fasciolatus. Change this name into *Barbus semifasciolatus*.

Page 176.

Add to the diagnosis of *Ceratichthys*, "Barbels sometimes entirely absent."

Page 177. Add:—

2 *a*. **Ceratichthys sallæi.**

D. 2/7. A. 2/6. L. lat. 54. L. transv. 8/9.

The height of the body is contained thrice and two-thirds in the total length (without caudal), the length of the head nearly four times. Caudal peduncle not quite twice as long as deep. *Barbels none*. Snout obtusely conical, longer than the eye, which is one-fifth of the length of the head. Upper jaw slightly overlapping the lower; maxillary not extending to the vertical from the front margin of the orbit. The origin of the dorsal fin is immediately behind that of the ventrals, and nearer to the root of the caudal than to the end of the snout. Fins short, caudal emarginate. There are five longitudinal series of scales between the lateral line and ventral fin. Brownish-green above, minutely dotted with black along the sides.

Pharyngeal teeth 4—4, long, curved. Intestines with only a few convolutions.

Mexico.

a–c. Adult, 3½ inches long. Cuernavaca. From M. Boucard's Collection.

Although this species is devoid of barbels, I refer it to *Ceratichthys*, as in several other species the barbels are quite minute.

Page 215. **Leuciscus aula.**

Leuciscus lascha (Costa) is synonymous either with this species or with *L. erythrophthalmus* (p. 232),

Add to page 258:—

78 *a*. **Leuciscus boucardi.**

D. 9. A. 9–10. L. lat. 39. L. transv. 7/5–6.

The height of the body is nearly equal to the length of the head, which is one-fourth of the total (without caudal); caudal peduncle twice as long as deep. Head thick, obtuse; eye of moderate size, two-thirds of the length of the snout, and two-ninths of that of the head. Snout convex, overlapping the lower jaw; mouth broad, its cleft not extending to the anterior margin of the orbit. Præorbital longer than deep, larger than the postorbital. Origin of the dorsal fin immediately behind that of the ventrals, and nearer to the root of the caudal than to the end of the snout. Caudal fin moderately forked; pectorals terminating at some distance from the ventrals. Lateral line complete. There are three and a half longitudinal series of scales between the lateral line and ventral fin. Back brownish; a bluish band along the side, terminating in a small blackish spot at the root of the caudal fin. Pharyngeal teeth 5—4, hooked.

Mexico.

a–d. Three and a half inches long. Cuernavaca. From M. Boucard's Collection.

Page 264. Add a new genus:—

60 A. GRAODUS.

Body oblong. Scales of moderate size; lateral line complete, running in the middle of the side of the tail. Dorsal fin short, without spinous ray, opposite to the ventrals; anal fin short. Mouth rather small, anterior, with the upper jaw somewhat longer. Upper jaw protractile, lower with the labial fold not extending across the symphysis. Barbels none. Gill-rakers rudimental. Pseudobranchiæ. The attachment of the branchial membrane to the isthmus takes place opposite to the angle of the præoperculum. *Pharyngeal teeth quite rudimental, replaced by a somewhat uneven ridge of the bone.* Intestinal tract short.

Mexico.

1. **Graodus nigrotæniatus.**

D. 9. A. 9. V. 8. L. lat. 35. L. transv. 6/4.

The height of the body is contained five times in the total length (without caudal), the length of the head four times and one-third. Snout obtuse, convex, longer than the diameter of the eye, which is two-ninths of the length of the head. The maxillary does not extend to the vertical from the front margin of the orbit. Præorbital about as deep as long, much larger than the narrow suborbital. There are three longitudinal series of scales between the lateral line and ventral fin. Origin of the dorsal fin opposite to that of the ventrals, and midway between the end of the snout and the root of the caudal. Caudal fin forked. Pectorals terminating at some distance from the ventrals. Caudal peduncle at least twice as long as deep. A black band, as broad as a scale, runs from the eye to the end of the middle caudal rays.

Atlisco.

a–c. Forty-six lines long. From M. Boucard's Collection.

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